DOMESTIC ENGINEERING

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The Master Plumber as a Merchant

It is so often said that this is the day of the specialist that any doctrine which upholds the advantage of more than one kind of business knowledge may be subject to the opposition of the advocates of specialization. Far be it from us to deny in toto the contention that doing one thing well is better than to do many things indifferently but we believe that in certain lines of industry a two-fold knowledge is to be desired. For example, the agriculturist who is successful in producing bountiful crops should make a study of market conditions that he may be able to dispose of his produce upon the most favorable terms. Similarly, a small manufacturer who cannot create an *alter ego*, in the form of a sales organization, to market his output, should have some acquaintance with the methods of salesmanship.

* * *

And then there is the plumber. Should not he be a merchant too? Should he suffer a tradition, which limits him to a display of his craftsmanship in the preparation of plans and specifications, to rob him of those opportunities to increase his business which are offered by an intelligent effort to make sales? How frequently he leaves to the customer himself the question of his customer's need. To direct him in the selection of the best goods, to suggest to him requirements of installation, which a false economy may impel him to disregard, to work honestly upon his imagination as to benefits to be derived from the use of equipment which at the outset the prospective purchaser may regard as luxurious and extravagant; to employ all those arts which lead the customer to realize his needs—these are methods, it seems to us, well worth the study of the master.

* * *

Leaving good merchandise in the store room or upon shelves, allowing it to depreciate and making scant effort or none to increase its turnover has made the difference between success and failure in more than one plumbing shop. On the other hand, merchandise that might have gathered dust until doomsday has been turned into cash with an element of profit by shrewd members of the fraternity who have turned to account a native knowledge of human nature, enabling the sale of a large bill in place of a small one.

* * *

In some instances we have known a plumber, possessed of so much of the merchant's instinct as to lead him to make a most attractive window display, to fail of a full realization upon his enterprise, even after prospective custom had entered the shop. Suppose that a real interest in the particular merchandise on display was not proved; suppose that a few idle persons never seem to have any other motive than that of curiosity—still some of the shop visitors had a real interest and, in the instances we have in mind, it would have been possible for the plumber to cultivate it. He could have led them to the examination of other goods, too, and could have induced a friendly discussion of their probable future needs and of his ability to serve them.

Some men are uncommunicative. Imagine one of this kind who, instructed by the household manager, halts on his way to town, steps into a plumbing shop and offers to make a trifling purchase—say a single basin stopper. Is he apt to volunteer any information about the plans for a new home, to be built in the spring, which he and the wife were discussing at breakfast? Not likely. But the same man, obtaining an impression of affability and a real desire to serve, and feeling a sense of welcome in the shop, might be glad to hear the proprietor tell of some new feature of installation or the excellence of a special line of fittings. His reserve, thawed out in this way, would allow his to talk upon the subject nearest his heart and the result would be a clue for the plumber-salesman.

Yes, indeed, the plumber should be a real merchant. He has the ability and the understanding. Nothing should keep him from it—least of all, obstinacy and a false respect for outworn tradition.

GETTING YOUR PRICE.

By Thos G. Wade.

A trip along the street any day, and season, any year will bring as many and as diversified answers to the question "How is business?" as a trip along the lake shore will demonstrate a thousand varied colored differently shaped pebbles. Why?

When business is good for John, why is it poor for Tom? When Dick says he is only taking work at his own price, why is Harry complaining that business is gone to the dogs and nobody can make money at the prices being quoted for contract work?

Here is a question for some student of political economy.

There is a viewpoint, however, which might well be a matter for serious consideration on the part of our contracting friends who are complaining that prices are shot to pieces, and business, because of too close competition, "on the bum."

Did it ever occur to you that in selling your time, your intelligence and the time of your organization, you are selling something the price of which is as much a matter of quality as it is of supply and demand.

Did it ever occur to you that when Ding Bast Johnson started in to sell his safety razor the first thing he did was to pick out a thing, in the merits of which he had absolute confidence and put a price on it that was commensurate with its value as a "quality article"; that he insisted on getting that price; that he educated the buying public up to the point where they were content to pay a good price in order to get an article, in the value of which they had confidence, and that finally he forced the dealer to pay him a good price, much against the dealer's will? And finally again that by forcing him to do so he made more money and more friends for that dealer in spite of himself than all the bargain displays and low-priced catch-penny schemes he could have thought up or had thought up for him in a lifetime; that after having done this he made money every time he made a sale, not only for himself but for the dealer and that he gave a good article at a good price to a quality-appreciating public, who came finally to the viewpoint, that the best was none too good, if the price was commensurate with the quality.

Did it ever occur to you that you are in much the same position that Ding Bast Johnson was when he started out? Are you a better contractor than Tom, Dick or Harry? Do you put more gray matter behind your bunch? Do you figure your jobs carefully, asking only a fair price for quality goods and workmanship? Do you know your business and demand fair compensation? Of course you think you do and will say so without hesitation and yet how do you show it? You put in a bid after having squeezed out everything possible (oftimes your own profit) to make it low; you wait until some architect or contractor or owner decides that Bill is low. It doesn't make any difference to any one except Bill that he may have left something out, taken the work at cost, or did any one of a thousand fool things that helps him to get a job that he would be fortunate sometimes to lose.

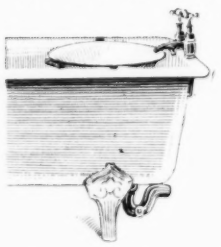
Then whether he is going to make money or not, what do you do? You yell: "Wolf! He took it below my cost." You go in on the next job determined to get under him and then it's his turn to yell.

Now the real situation is that you are both butchering alternatively and both yelling alternatively, but both continuously losing sight of the fact that you have something to sell that has tangible fixed values.

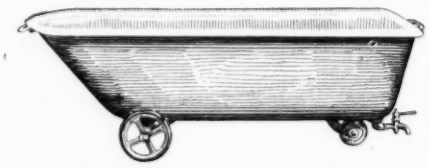
You put in your figures and stop, waiting for some fellow to decide. On what? On a price basis, and that's wrong. Cut out the price-cutting, put in a fair price; go out and use the ability with which you have been endowed; use your initiative, your salesmanship, your personality; get to the buyer, to the man who decides; show him that quality should come first, then price, and not the other way around. You can't do it altogether by advertising; you're not big enough; your field is not broad enough; but you can do it by constant personal effort, augumented with the right kind of letters, a little judicious publicity. Let the other fellow put in the low price and wait. The very fact that he does it shows him as weak. Get out of his class and stay out. Insist on prices commensurate with the quality of your work. Talk for the good heating system, that at a fair price will do its work; for the plumbing fixtures that are standard and will last; for quality always; and then just as sure as Dr. Johnson gets $5.00 for his razor while others are selling for 25c, just so sure (slowly at first, but surely) will you come to be recognized in your community as a "quality man," doing "quality work," for which the American people have always shown themselves ready and willing to pay "quality prices."

ENGLISH NOVELTIES IN BATH-TUBS.

Every true Englishman insists on having his "tub" every morning, the desire to bathe being one of his characteristics. It is natural, therefore, that British manufacturing concerns should keep well to the front in the introduction of new forms of bath and bath accessories, says "Popular Mechanics."



One novelty recently brought out is a bath-tub mounted on wheels for use in hospitals when the patient is unable to walk to a bathroom and therefore the bathroom must come to his bedside.



English Bathtub Mounted on Wheels.

Another innovation is a wash basin which sets on the edges of the tub, under the faucet. Anyone who has tried to wash his face or hands at a bathtub will realize its usefulness.

The Responsible One.

It it wasn't for the watch-mender, we wouldn't have such a good time.—Philadelphia Bulletin.

The Rivals.

Riggs—"Singular, isn't it, that neither of your stenographers wants a vacation this year?"

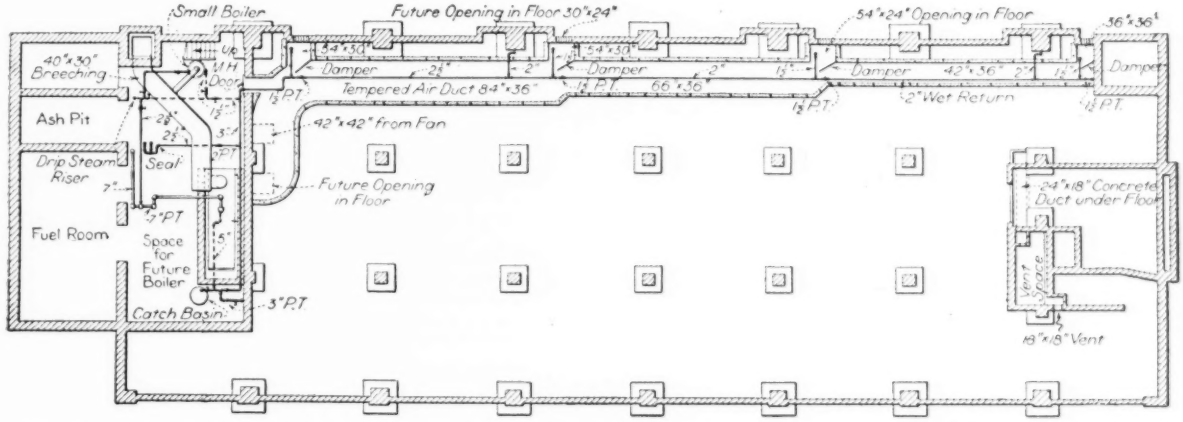
Griggs—"No; it's easily explained. I recently took a good-looking young man into the office, and neither of the girls is willing to go away and leave the field to the other one."—Purple Cow.

Heating and Ventilation of a Mitten Factory*

By Samuel R. Lewis

The object of this paper is to describe the heating and ventilating arrangements of the factory of the Defiance Tick Mitten Co., Toledo, O. The first floor is used for storage, packing, etc., while the second floor is occupied by about 250 operatives, nearly all women, who work at baths, rest rooms, etc., the tendency is to maintain a full force when labor is scarce, at the expense of competitors who have less attractive shops.

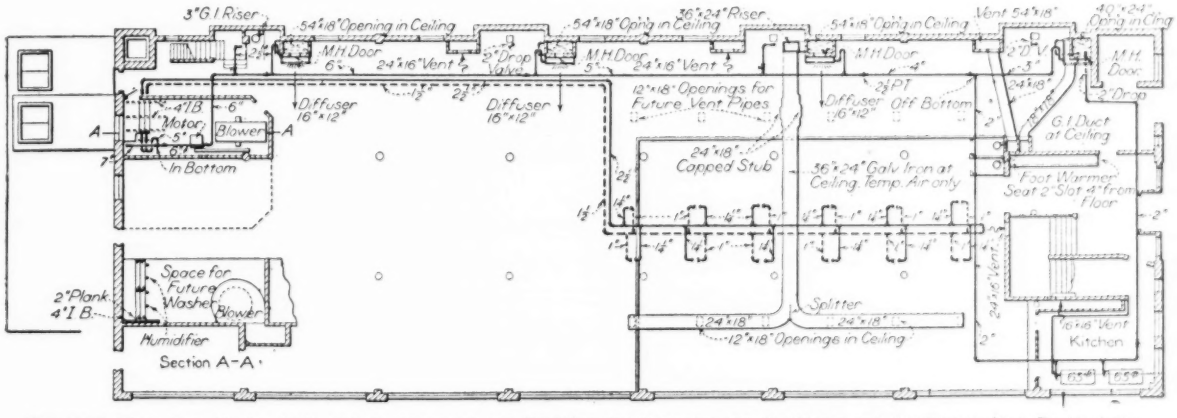
The building is of reinforced concrete construction, with brick curtain walls and a saw-tooth roof. The windows



Basement Plan, Showing Tempered Air Duct Supplied by Fan on First Floor and Leading to Flues Containing Heating Surface.

power sewing machines, pressing and finishing tables, etc. There are a number of steam-heated forms upon which the finished gloves and mittens are pressed. The desire of the owner was to provide an especially sanitary, light and attractive building, as he had learned by experience

are all in steel sash. The roof is of composition, laid on matched plank, and supported on steel trusses. The building is intended as the first of a group of a similar type, surrounding a central administration building and power plant. It is one-half of a future unit, and the division of



Basement Plan, Fan Heater Unit and Arrangement for Doubling the Capacity and the Steam and Air Distribution, Particularly for Second Floor.

that these features had so great an influence on the attendance and efficiency of the labor that it was a good business investment as well as a function of good citizenship to provide them. The operatives are nearly all paid by piecework, and are found to be quite independent as to their attendance. By providing pleasant and healthful surroundings for the girls and women, with such equipment as individual steel lockers, a warm lunch, shower

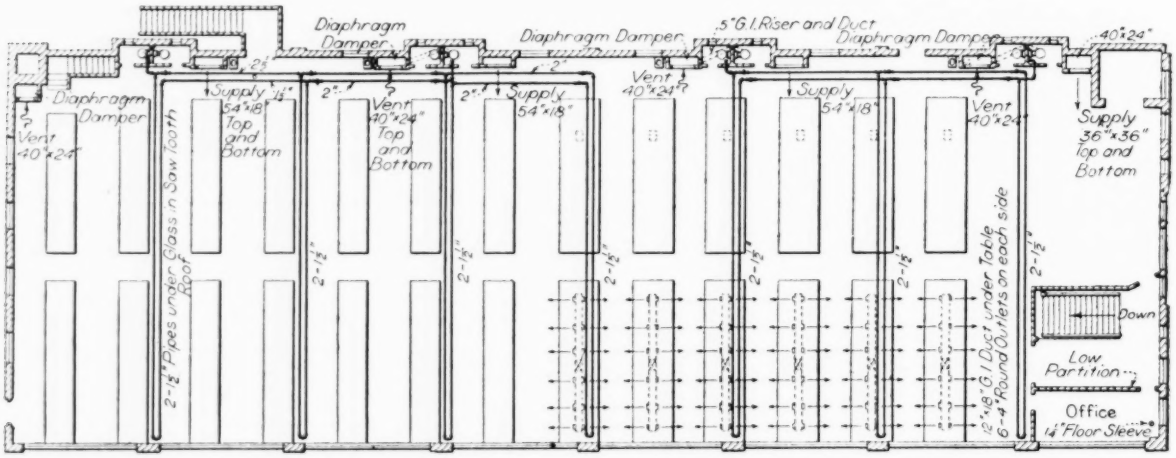
the apparatus is such that the boiler, fan, coils, etc., for the other half may be added later on. Thus, the cost of the present plant was very little in excess of what it would have been had there been no thought of future additions. The boilers are placed in a sub-basement; one has capacity for all heating, ventilating and manufacturing requirements, and the other is provided for summer use for manufacturing and water heating. The principal manufacturing demand for steam is for heating the metallic forms used in pressing the finished product.

Fresh air is supplied through special steel casement

*Read at the semi-annual meeting of the American Society of Heating and Ventilating Engineers, held at Detroit, Mich., July 11, 12 and 13, 1912.

sash, and is drawn through tempering coils and steam jet humidifiers to the supply fan. The steam supply to the tempering coils is controlled by a thermostat so that the tempered air is never cooler than about 60 deg., or warmer than that, unless the outside temperature is higher than

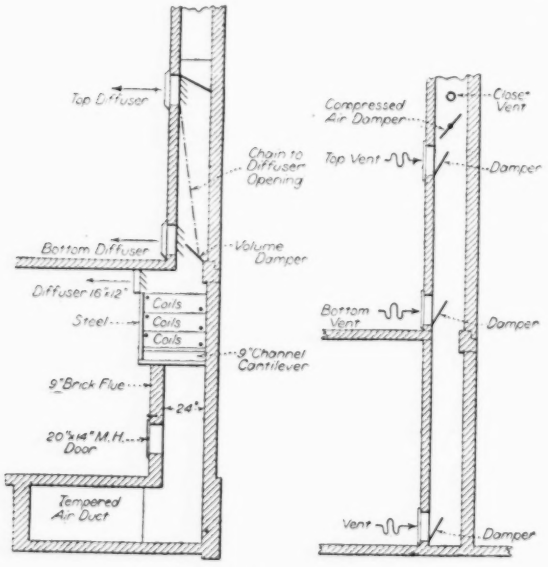
first floor, but their principal function is to serve the second floor, where a minimum of 30 cu. ft. of fresh air per occupant per minute is provided. When the building is being heated, the fresh warm air is discharged at a point about 10 feet from the floor through adjustable diffusers.



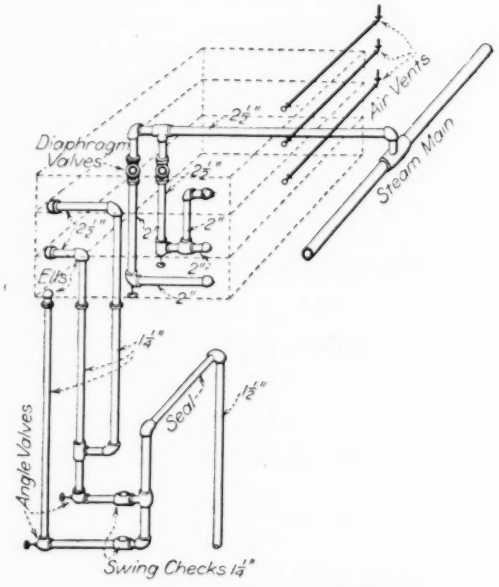
Second Floor Plan, Showing Air Supply Underneath Tables, Heating Coils Under the Sections of the Sawtooth Roof and Location of Fresh Air and Vent Flues.

60 deg. The steam jets are controlled by a sensitive element which operates within a range of less than 5 per cent of the point at which it is set (about 40 per cent relative humidity). The supply fan delivers this conditioned fresh air through a concrete duct (which also serves as a

It passes across the skylights and is forced against the almost continuous glass surface of the opposite wall. When the building is warm, however, the fresh air is discharged at the floor line through adjustable diffusers, directly at the lines of operatives. When heating, the exhaust air



Typical Fresh Air and Vent Flues.



Typical Connections to Heating Coils.

return pipe trench) to the bases of the various flues. These flues have, near the ceiling of the first floor, individual heating coils, which have automatically controlled steam supply valves. The thermostats which operate these valves are of the gradual or stage operating type, and reduce or increase the amount of heated radiating surface as the temperature requirements dictate.

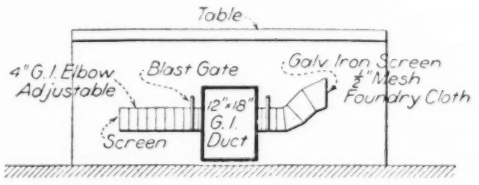
The various supply flues discharge some air into the

leaves the room at the floor, but when cooling or merely ventilating, the exhaust air leaves the room at the ceiling To this end, each supply flue and each vent flue has two openings, with adjustable dampers in each.

In order that the operatives at the steam-heated forms may have the maximum of comfort, a 4-in. tempered air inlet at the floor, with an adjustable universal elbow and a blast gate for regulating the volume to each person, is

provided. To offset possible cold drafts from the exposed roof or skylights, pipe coils under separate hand control are placed under each saw tooth glass area.

Many of the operatives walk some distance, and are liable to arrive at work with wet skirt bottoms and damp feet and ankles. A floor inlet would be objectionable from sanitary reasons, and so the concrete bench for drying purposes is provided and has proved quite effective. The seat is warm, about 100 deg., and through slots in its face



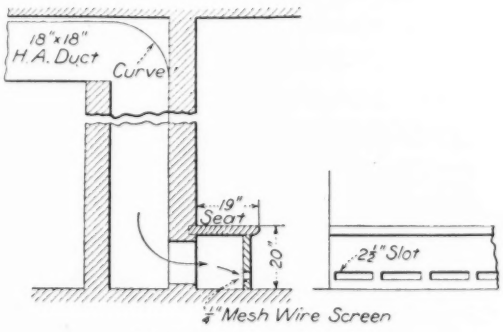
Adjustable Galvanized Duct Under Table.

a little above the floor, a strong blast of air as about 120 deg. maximum is delivered parallel with the floor. This air also warms the entrance hall and stairway.

The escape of air from the building when it is unoccupied may be cut off by special dampers in the outlet flues, all being operated by compressed air by one switch valve in the fan room. All toilet fixtures are individually ventilated through local vent openings in the bowls to separate vent flues.

There is no direct radiation. The plant has been in operation through the severe weather of the past winter, and has proved entirely adequate. There have been no objectionable drafts, though many operatives sit at work directly alongside the exposed glass surface opposite the supply inlets. It has been found so far that the coils in the skylights are unnecessary.

The ventilation has been excellent. It has been found economical to keep the outlets closed and to rotate the air within the building, taking in no outside air when heating prior to occupancy. There has been increased comfort and no objectionable odor when the humidifying ap-



Air Warming Seat in Hall.

paratus was in use, and when the temperature was kept down to 65 deg. There was no serious complaint of overheating with the temperature at 70 deg. and the humidity at 40 per cent relative.

The absence of direct radiators contributes greatly to the ease of cleaning, and to the comfort and fuel consumption. With this system, the loss of heat through the glass and wall surface, for instance, is less, since the inside temperature is close to 70 deg. all over, while with direct radiators it would be close to 212 deg. opposite every unit.

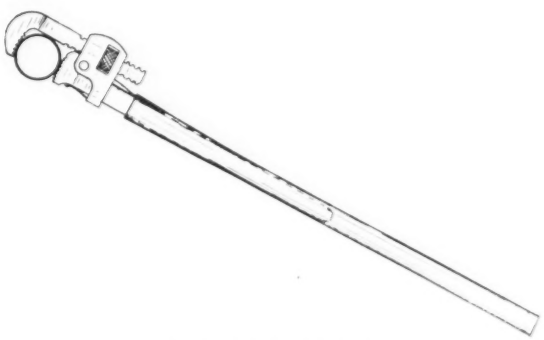
Langdon & Hohly, of Toledo, Ohio, were the architects of the building.

INCREASING THE LEVERAGE.

By W. H. Wakeman.

While considering the subject of using a pipe for leverage in screwing fittings on pipes, I recalled a plan that was formerly used in my plant, to unscrew pipes and fittings that had been in place so long that it was a difficult matter to start the joints when making repairs.

An old 24 inch Stilson wrench was kept for this service. Taking a piece of galvanized 1½ inch pipe about 4 feet long, I flattened one end until it would slip over the handle as shown in the illustration. This gave an exceedingly great leverage on the pipe, but it was necessary to use it cautiously because no wrench is strong enough to withstand the strain that can be applied under such abnormal conditions. On one occasion it was necessary to remove a 2 inch right and left coupling that had been in use about 10 years. Two men on the wrench handle could not start it, and of course it was impossible to break it because it was not made of cast iron. Furthermore, we wanted to save it, not on account of its market value, but owing to the fact that another was not at hand.



Increasing the Leverage.

One end of the pipe above mentioned, which was kept for this special purpose, was slipped over the handle. One man pulled steadily and cautiously on this lever, while the other struck the right and left coupling with a hammer. In this way it was removed in good order, and after changes were made in the pipes above it, this coupling was returned to its former place and is still in service. Other hard jobs were managed in the same way with equal success and satisfaction.

It is, however, not safe to recommend such a plan for general use, because somebody will fail to exercise good judgment in applying it, and consequently will declare it a failure.

The Hint That Failed.

Visitor—(waiting an invitation to lunch)—"Two o'clock! I fear I'm keeping you from your dinner."

Hostess—"No; but I fear we are keeping you from yours!"—Meggendorfer Blaetter.

The Cowardly Sort.

"When I arose to speak," related the martyred statesman, "some one threw a base, cowardly egg at me."

"And what kind of an egg might that be?" asked an attentive listener.

"A base, cowardly egg," explained the statesman, "is one that hits you and then runs."—St. Paul Pioneer Press.

THE HEATING MAIN—IX.

Conclusion.

The matters relative to the heating main, so far in this series, have been confined, almost exclusively, to the construction of said main. There is, however, another side to the question, which is quite important, and that is "the main's size."

About five years ago a party from the state of Minnesota wrote a letter to the editor of "Domestic Engineering" and asked for some information relative to the sizes of flow and return mains. As the result of that inquiry many letters were received from different parts of the country and these letters contained the practices of the different shops where they were used. Now we will start out with the assumption that those parties knew what they were doing, for they were men who had been in the business many years and certainly had the chance to observe and try out the points that they were talking about. Yet there is a wide difference in the different amounts of radiation that they allow for the different sizes of pipes. I wish to quote a few just to show what the difference is. I refer to single pipe work and the pressure, in the instances which I shall quote, will not exceed five pounds. One gentleman gives a two-inch main as carrying from 126 to 250 feet of radiation; another puts it at 400 feet, while various others have different amounts assigned.

In several of these instances, as in many others which have been published at different times in many places, you will note that little or nothing is said about the length of the main. It is certain that all steam mains are not of the same length; indeed, there are hardly two that measure the same, exactly. Suppose that a fitter has 400 feet of radiation to supply through one main and appropriate branches? Now this may be in a very compact building where he can get to the radiators by using a main which would not exceed thirty or thirty-five feet in length. That job will work all right, provided a reliable boiler is used and proper attention given to the mechanical portions of the installation.

Suppose, however (and it is entirely feasible, there being different buildings requiring such a run of piping), that this same fitter has 400 feet of radiation to be supplied and the lay-out is such that his main will be 350 feet long? Will that same size of main (two-inch) supply that same amount of radiation, 400 feet at that distance (gravity and not vacuum work) and at the same pressure?

In figuring a job of heating how many ever allow anything for the fittings? And yet it is given that in case of obstructions a right-angle ell should be considered as 40 diameters, a tee (the entrance to) as 60 diameters and a globe valve as 125 diameters, and the length of the pipe increased accordingly. An instance is given as an illustration which shows this matter so thoroughly and bears upon the point, and I am going to quote it directly.

Relative to this point it is said, "I have known instances where from 1,200 to 1,500 ft. of surface have been carried on a three-inch main." I have known numerous instances where trouble with the water line developed and solely because of the fact that the great number of fittings so decreased the pressure at end of supply main that the straight drop from the supply pipe to water line of boiler was some inches less than it should have been. Suppose that there was full 1,500 square feet on the 3-inch main; also 6 right-angle ells, 10 tees, 2 globe valves and that the main was 88 feet long. Working out the diameters as per calculation given, each ell shows 40x3 or 120 inches, or 10 feet of pipe; the six ells would then give 60 feet of pipe; the tees give 150 feet of pipe and the globe valves 62. In all, as the length of that main we have the sums of 88, 60, 150 and 62, or a total of 360 feet of pipe.

How many fitters would have "allowed" anything for the tees, ells and valves?

In the 3-inch main just referred to it is evident from the illustration given that because of the tees, valves and ells on said main, that instead of 88 feet to figure on there is the equivalent of some 360 feet of main pipe. It is stated, "according to note 2, if the pipe was 300 feet long the factor of .58 was to be used; if 400 feet, the factor .5."

To find the factor in this case an average was taken of the two just mentioned and the factor .54 was obtained as the proper factor to use for the occasion. The 1,500 sq. ft. which could be carried on 100 straight feet of pipe was then multiplied by .54 and it was found that 810 feet, only, should have been put on the main under the conditions intended at the time when the table was made.

Now what I am getting at, by citing these cases, is the fact that not one fitter in five would have considered the tees, ells and valves at all. They would have just lumped the whole business and let it go at that. Don't you know it's the truth and have you not seen it done more than a dozen times in the course of your career in the craft and the business? Who, among you, ever takes the time to allow anything for the fittings on the job? Who ever takes into consideration that two or three valves might, perhaps, make some difference?

Let us take the very instance cited and see how it would work out if put to a bid between two men, the one a practical fitter, the other a man of natural "lumping propensities." The former bidder knows, from his figuring, that the main should carry only 800 feet, approximately, so he makes the provision for a main large enough to do the business required and of course has to raise his figures correspondingly.

The "natural lumper" isn't afraid to take a chance on that 3-inch main to carry 1,500 feet. So his bid goes in, lower than the other, and of course he gets the job and puts it in according to the way he figured.

What happens? It doesn't work as it should and our "lumper" is in trouble.

That is one of the principal reasons why this talk on sizes of mains crept into this series. After taking all the pains possible, in the manner described in the previous chapters to hang that main so that it would be "a thing of beauty and joy forever," you would feel pretty sick indeed, wouldn't you, if it turned out that the main was not figured properly and that it all had to be pulled down and replaced with another main. Phoenix.

BUSINESS CHANGES.

Moline, Ill.—Nels J. Hansen, who has been an employe of the Moline Heating & Construction Co. for the past twenty-five years, the greater part of that time as foreman of the steam fitting department, has associated himself in business with Frank P. Styvaert and George Speck in the Sanitary Plumbing Co. All contracts taken for steam, hot water and vacuum heating, by the Sanitary Plumbing Co. either by the firm in Moline or East Moline, will be superintended by Mr. Hansen, while Messrs. Styvaert and Spect will devote themselves to the plumbing work. The Sanitary Plumbing Co., now located at 409 Fourteenth Street, is seeking larger quarters and has already secured option for a lease of a new building.

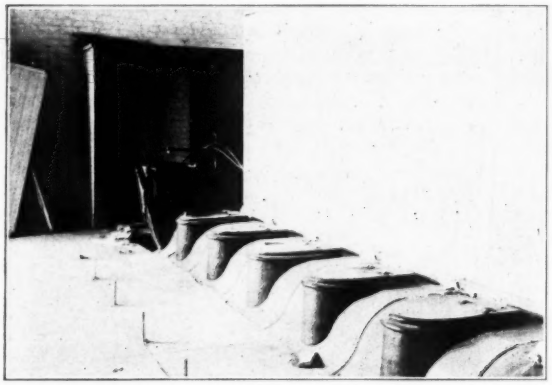
The Great Returner.

The prodigal son can give the borrowed umbrella cards and spades at getting back home.—Washington Herald.

WHAT HAPPENED TO THE LATRINE SYSTEM AT PASADENA, CAL.

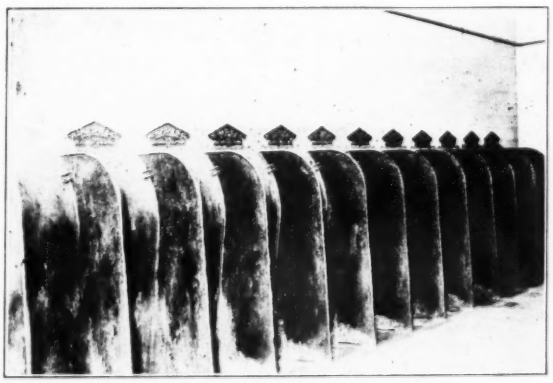
By A. C. Shaver.

Shortly after accepting the position of plumbing inspector of Pasadena, Cal., I made an inspection of the toilet rooms of the public schools and found that they



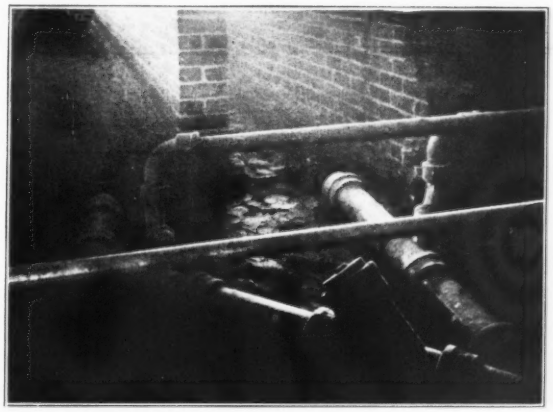
Condemned Latrines, with Flushing Device in Background, Operated by Janitor.

were using the latrine style of closets in six of the buildings; knowing this to be an obsolete system that had been condemned by sanitary experts, I made frequent inspections from time to time and found it to be an absolute impossibility to keep the toilet rooms in anything like a sanitary condition where these fixtures were used, so decided that the rooms must be remodeled and the latrines removed.



Condemned Urinals of Non-Flushing Type, Badly Corroded.

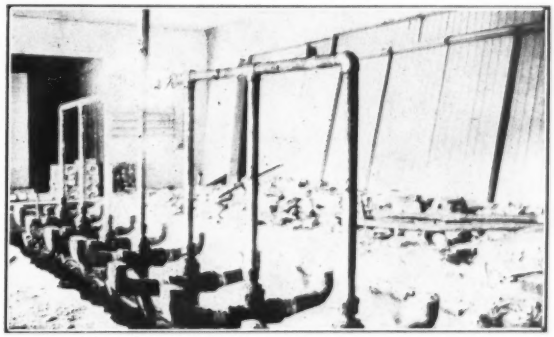
To make a decision of this kind is all very nice, but to enforce it is another thing. I found much opposition from the first, not only from the Board of Education, but from the manufacturers who sent numerous letters to the City Council and Board of Education, telling what a large number of cities had their system of closets and what a useless expenditure of money it was to take out that most modern closet installation, the latrine, just because it did not suit the fancy of some theorist. Every known opposition was brought into play, from getting



Brick Ducts in Which the Latrines Were Located. Drainage and Vent Connections Are in Foreground.

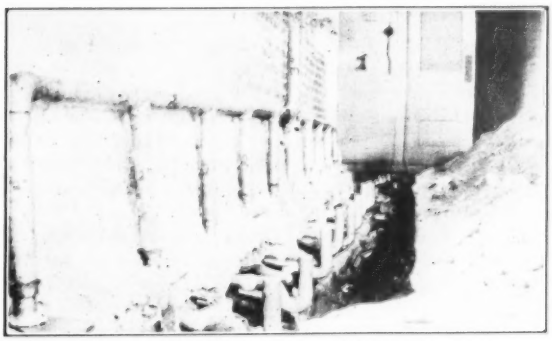
reverse decisions from plumbing inspectors in adjoining cities to bringing politics into play.

I kept up a running fire by having printed in the local papers, clippings from the trade journals and decisions



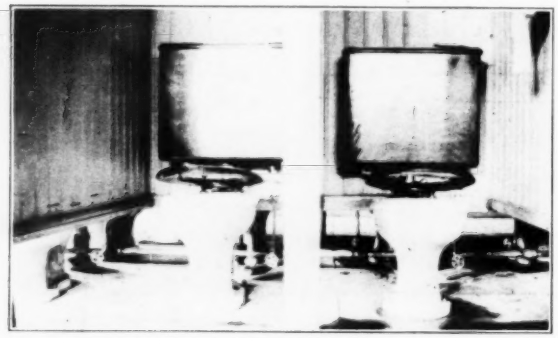
Roughing-In Work for Seat-Action Closets.

from prominent inspectors and any other honorable way I could gain a point; but frequently I would receive a broadside that would stagger me for a while, but in modern warfare it is the small rapid firing guns that are the most effective so I kept plugging away at vital spots, landing building after building, until I got the last one which is known as the Old High School Building, the toilet room photographs of which are shown herewith.



Roughing-in Work for Porcelain Urinals Which Replaced the Old Cast Iron Urinals.

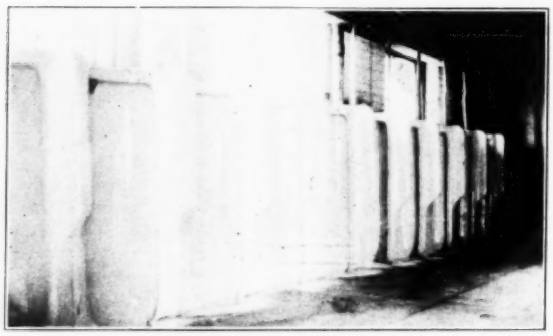
Three of the illustrations show condemned latrines and urinals, and the others show a part of the rough and finish of the new work. The closets and urinals are the



Seat-Action Closets That Replaced the Latrines.

John Douglas make; the closets are the seat action syphon jet, the urinals the modern glazed white porcelain.

The illustrations with their descriptions will give the



Porcelain Urinals That Took the Place of the Cast Iron Affairs.

reader a pretty clear understanding of what really took place.

WHEN PLUMBERS EARNED TEN CENTS A DAY.

In a very interesting article entitled "The Mediaeval Plumber," the "Builder" of London, England, gives some interesting details of plumbing work and the payment for the same in the "Middle Ages." Says the writer:

The mediaeval plumber occupied a somewhat indefinite position as a crafts man. From the nature of his calling he was frequently required to work by the piece. The records of these jobs afford us little aid in attempting to appraise the value of his labor. It would be supposed that when working by time a comparison of the wages earned would enable us to easily estimate his position. But here again we find a difficulty in the fact that his wages varied widely. Sometimes a plumber would be paid 5d. (ten cents) a day, at another time he received 11d., his assistant, or "server," getting 4d. to 6d. a day.

The mediaeval plumber often cast and recast the lead in "fyllettes." We read of the purchase of bellows for the fire in which the lead was melted, the "mold" and "panne" used, and "the syve to syfte their sande in." (Public Record Office Exch. Acc 488-28-30.) The mould mentioned above was made by a carpenter, and was of sufficient value to be conveyed about from one scene of operation to another. The plumber operated on cisterns, pipes, gutters, etc., and the purchase of lead, solder, nails, and wood for his fire, known as tallwood or byllettes, are common items in mediaeval builders' accounts.

In the records of the Church of St. Mary-at-Hill, near London Bridge, printed by the Early English Text Society, will be found a plumber's bill for a large quantity of lead supplied in "quarters" to the churchwardens. In this volume, too, we have an account of money laid out for a shoulder and a breast of mutton for the plumbers and of "brekfastys" prepared for them. In some accounts (Rec. Off. MS. 489-9) we read of the engagement of a plumber to work at Carnarvon and of his ride on horseback to Bangor to fetch his tools, the expenses of the journey being defrayed by his new employer. In another set of accounts (MS. 488-27) we find the cost of carriage of the tools of the plumbers set down as paid by the employer. In another series of accounts (489-7) is an interesting little story of the failure of two plumbers to keep an appointment. We may summarize the details as briefly as possible:

On June 20, 1532, Rauf Ratclief, who was employed as a laborer at Beaumaris Castle in North Wales, was sent by John Karvar, the "master of the workes," to the Abbey of Whalley in Lancashire to fetch two plumbers. Ratclief rode all the way on horseback, the cost of the hire of the animal, 3s. 4d., being defrayed by the master of the works, the messenger himself receiving also 3s. 4d. Ratclief delivered his message but without success, for the record tells us that the two plumbers failed to "appere at Lammas" (August 1st). A second messenger was despatched. He, too, was a laborer, and his name was Thomas Haltmegge. He, too, rode a horse "lente" him by the master of the works, and, like Ratclief, he also received 3s. 4d. for himself, the same sum being paid again for the hire of the horse. Haltmegge was more successful, and the two plumbers arrived at Beaumaris Castle on August 21, where they worked for three days, one receiving 6d. a day and the other 5d. The failure of the plumbers to appear when wanted so much incensed John Karvar that on August 28 he "bounde the above-named plummers to appere there agayn at the Feast of Ester or within viii. dayes then nexte followyng then and there to work vpon the Kynges workes and not to departe withoute lycens, gyvyng them towards their costes homewardes xvid."

Why plumbers should be required to come all the way to North Wales from an abbey in the north of Lancashire, a distance there and back, as the record itself tells us, of 200 miles, is not clear. The above, however, is not the only instance of plumbers being fetched from this abbey. In some building accounts, numbered 488-27, we read of a man being sent to fetch two plumbers from Whalley Abbey to do work at Hardelargh, also about 100 miles from Whalley. In this case the cost of the plumbers' journey "cumyng and goyng" amounted to 6s., and the men worked for six weeks. The names of these two men were respectively Nicholas and Robert Whalley (the surname evidently a corruption of Nicholas and Thomas of Whalley). Of the two Nicholas held the higher place, but both men, if we may judge from the wages paid them, were singularly expert craftsmen. Nicholas received the unusual wage of 11d. a day and Robert 10d.

Scientific Economy.

"You have been a bad boy, Tommie, and I will have to punish you."

"Can't you wait, mamma, until I have another tooth pulled, and then one hollering will do for both!"—Yonkers Statesman.

Laundry Fixtures

Cement, Wooden, Soapstone and Slate Laundry Tubs

By Henry D. McCormack, C. E.

Cement Tubs.

The cheapest make of laundry tray is made of cement, reinforced with expanded perforated metal and protected at the top and edges with a metal casing; a laundry tray of this description is shown in Fig. 1. Cement tubs, when made of portland cement and clean sharp sand, mixed in the proper proportions, have been found very

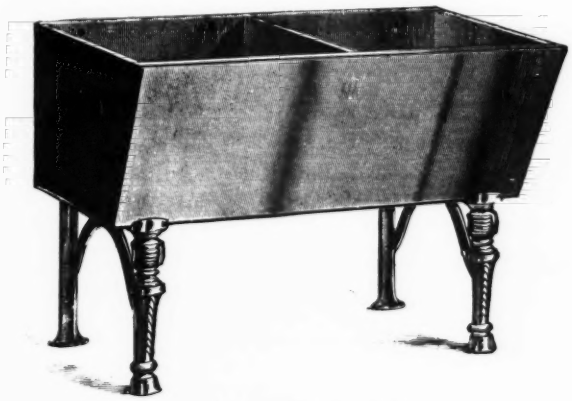


Fig. 1. Cement Laundry-Tub.

serviceable. However, there are cement tubs on the market made of ashes, cinders and natural cement. Such tubs are so porous that when filled with water, moisture will show on the outside of the tubs. It is needless to say that great care must be exercised when purchasing tubs of this description, to see that the cheaper and less sanitary grade is not delivered. When ordering cement tubs it is good policy to specify, in addition to the various sizes and dimensions, the materials of which they shall be made, and the tests they will have to successfully withstand. A requirement that the tubs stand full of water for two hours, without moisture showing through on the outside, would seem a fair and satisfactory test, without being an unreasonable requirement.

TABLE I.

Dimensions of Cement Tubs.

Number of Parts.	Length, Inches.	Width, Inches.	Depth, Inches.
2	48	21	16
2	48	24	16
2	53	24	16
2	60	24	16
3	72	21	16
3	72	24	16
3	80	24	16
3	90	24	16

A feature of cement tubs which has had a marked effect in marketing them is the fact that sets of tubs are made in several different sizes, thus enabling the architect or plumber to specify tubs which will fit the space allotted to them. This consideration is of more importance in the large cities, where apartments are built with the least possible space being allowed for plumbing fixtures, and where the ingenuity of the workman is often sorely taxed to get the plumbing fixtures in the space shown on the plans. The dimensions of cement tubs can be seen in Table 1.

The waste connection to cement tubs is another consideration which recommends them to favor for cheap work. An iron twin waste is provided which unites the two tubs near the center partition, in the case of a set of two tubs, and, when tubs are made in battery, the outlets from the three tubs are connected together by means of an iron waste connection bedded in the cement, so that all the work necessary, when connecting these tubs, is to connect the lead waste pipe to the coupling which comes with the waste outlet. The overflows are equally simple and economical to install; each partition

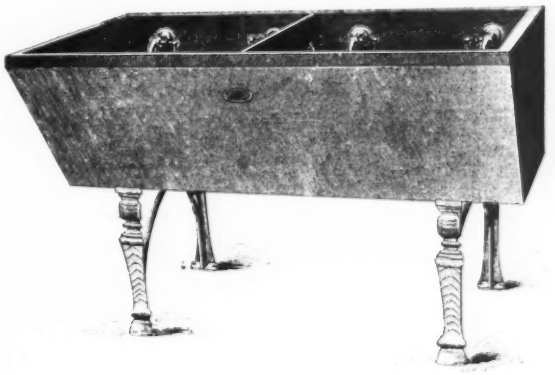


Fig. 2. Slate Laundry-Tub.

has a hole through it, leading to the next tub at the level where it is desired the tubs to overflow; and the end tub towards the waste pipe is provided with an overflow coupling, so that the overflow from this tub can be connected to the waste pipe on the house side of the trap. Of course, this is not the cleanest or best method of connecting an overflow from tubs, but, then, cement tubs are not recommended for their sanitary qualities, but because they combine a great convenience with the element of cheapness, thus making possible the installation of stationary tubs in houses which otherwise would have to go without.

Cement tubs of three compartments, also, in some cases, cement tubs of two compartments, are made right and left-handed. That is, the embedded waste connection is set to point towards one end of the tub, so in ordering it is well to state whether right or left-hand tubs are wanted. Holes are left in the back of each cement tub above the lever of the overflow holes, so that hot water and cold water can be connected to the tubs; sometimes these holes are not cut clear though, but have sufficient material left to close the extra opening in case cold water only is piped to the fixtures. The corners and angles of cement tubs are rounded off, and, so far as the materials

used will permit, everything possible has been done to make the tubs conform to the requirements of a sanitary article.

The legs for cement tubs are made of cast iron and may be had either painted or galvanized. The legs play no part in keeping the tubs in place, merely to support their weight, the pipe connection being depended on to keep the tub from falling sidewise. Provision is made to fasten the legs to the floor, and this should always be done, to prevent a sudden blow from displacing the leg and allowing the tubs to fall to the floor. The legs can easily be secured to a wood floor by means of screws and expansion joints will easily, firmly and safely secure them to a cement or tile floor. Cement tubs are generally supplied with white ash tops and hinged covers. The covers are hinged to the top, which, in turn, are secured to the metal rim of the tubs by firmly bolting them in place. Metal covers are also made, which may be used not only on cement tubs but also on any other desired make of laundry tubs.

Wooden Laundry Tubs.

Wooden tubs were the first kind used for laundry purposes, and naturally the first stationary laundry tubs made were of wood, but the superiority of other materials for this purpose has about driven wooden tubs from the markets. Wooden tubs are made out of 1¼-inch white pine, grained or dovetailed together at the ends and held together by means of iron rods. The tubs are put together at the joints with a plentiful supply of good white lead between, to prevent moisture entering, lodging there and rotting the tubs. Great latitude was generally allowed in the making of wooden tubs, as they were usually made on the premises by the carpenter, who had no standards to follow. In many installations wooden tubs were lined with some metal, usually either zinc or copper. Such tubs were quite sanitary until holes became worn or punched through the metal, when they became as bad, or worse, than unlined tubs. Wooden tubs which would not hold water, owing to their leaky condition, were often lined with metal, thus making them good as new.

Wooden tubs are objectionable chiefly because of their porosity, which permits them to absorb water and organic matter from the soiled water, and give off a disagreeable odor when the organic matter begins to decompose. They are further objectionable on account of the repeated wetting and drying, which soon spoils the joints and rots the wood. Tubs which are in use daily and are constantly wet are not nearly so objectionable or so liable to rot as wooden tubs which are alternately wet and dry. For this reason the use of wooden tubs is generally permitted in commercial laundries and in the laundries of hotels, institutions and apartment houses. A battery of wooden trays in a private house will seldom bear close inspection below and behind. There is usually much doing in the way of water bug activity upon the unseen portions of the tray. There is always dampness and decay, and sometimes mold, and general unattractiveness.

Soapstone and Slate Laundry Tubs.

Soapstone, slate or any other natural stone which is nearly or quite non-absorbent, that can be cut into slabs which will have sufficient strength for the use, and which is susceptible of a slight polish, can be used for the manufacture of laundry tubs or trays. Soapstone and slate each combines all those requirements and have been extensively used for laundry tubs. When properly cemented together they are both cheap and durable and have been extensively used. Soapstone and slate laundry tubs are made exactly alike and differ only in material. Soapstone has a more or less slippery or soapy feeling, to which it owes its name, while slate is less slippery to the touch. A tub which may be either soapstone or slate is shown in Fig. 2. It is not much different in general appearance than the cement tub shown in Fig. 1, but is a better grade of tub, owing to its greater strength and less absorptive capacity. Slate and soapstone tubs are made in much the same manner that wooden tubs are made, and the joints are put together with a red lead cement between. They are objectionable on account of the square corners and angles, which do not permit of as easy cleaning as though they were rounded. The dimensions of soapstone and slate tubs are shown in the following table:

TABLE II.

Dimensions of Slate Tubs.

Number of Compartments.	Length, Inches.	Width, Inches.	Depth, Inches.
1	24	24	16
2	45	21	16
2	54	24	16
3	78	24	16

Each soapstone and slate laundry tub is bored with a waste hole for 1½-inch pipe, and the waste outlet is countersunk, so a laundry tray plug can be bolted to the outlet. The lead waste pipe is flanged out onto a bed of putty over the top of the countersink around the waste outlet; the laundry tray plug is then bedded in putty above the lead flange and screwed down by means of the brass bolts, which pass through the bottom of the tubs through holes drilled for the purpose. The overflow connection is made in the same manner. Holes for hot water and cold water faucets or wash tray cocks are likewise made in the slab forming the back of the tray and special cocks, known as wash tray cocks, are used. Wash tray cocks differ from sink cocks principally in having a flange, which fits against the slab, to make a neat finish.

The legs for soapstone and slate tubs are very similar in design to those used with cement tubs. They differ chiefly in being a little heavier and stronger. Like cement tub legs, soapstone and slate tub legs are made of cast iron and may be had either plain or galvanized. They likewise are made to be secured to the floor, which can be done by means of screws or expansion bolts. The covers that go with soapstone and slate tubs are made very similar to the covers for cement tubs, with the single exception perhaps that they are paneled. Plain covers, however, can be had for soapstone and slate tubs, as also can metal covers, made of galvanized iron, if desired.

(To be continued.)

A Simple Twist of the Wrist.

"You know Jones, who was reputed so rich? Well, he died the other day, and the only thing he left was an old Dutch clock."

"Well, there's one good thing about it; it won't be much trouble to wind up his estate."—Sacred Heart Review.

First Aid.

A little lad was desperately ill, but refused to take the medicine the doctor had left. At last his mother gave him up. "Oh, my boy will die; my boy will die," she sobbed.

But a voice spoke from the bed, "Don't cry mother. Father'll be home soon and he'll make me take it."—Woman's Home Companion.

The New Sewerage System of Baltimore

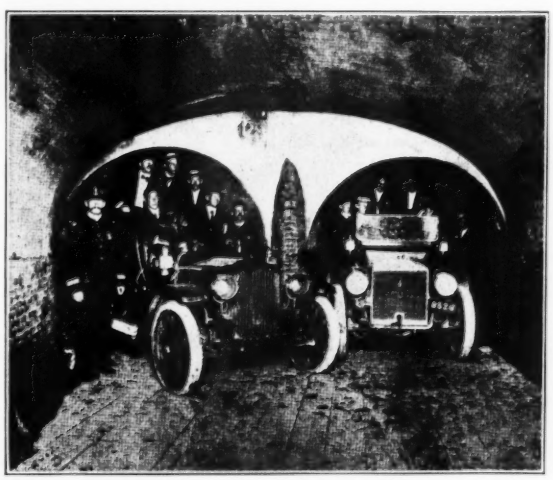
By Stuart Stevens Scott, in "Municipal Engineering"

Baltimore's sanitary sewerage system, which is being installed at a cost of upwards of $14,000,000 and which has presented some of the most difficult and unique engineering problems, is now about one-half completed. Already, however, a considerable portion of the completed system is in actual use and as fast as sections are ready, the connections with houses are being made. The sewerage commission in a recent report states that the entire work will be completed in 1914.

The work of constructing is particularly interesting because of its magnitude and difficulty. It has been the purpose of the engineers to rely, as much as possible, upon gravity. This means that an 8-inch sewer beginning at Forest Park, a suburb to the northwest of the city and 13 miles from the disposal plant, must continue on a constantly falling grade, which cannot be flattened beyond certain rates, ever increasing in size as sewers lead into it from valleys and hills covering 32 square miles.

From Forest Park this main sewer crosses a stream, goes under the B. & O. railroad tunnel, over another stream at one point, and under the same stream at another point, goes under the Pennsylvania railroad tunnel, crosses ravines, swings around hills, goes through ridges, through narrow valleys, by the side of tall buildings, its size steadily increasing until, at the disposal plant, it is large enough to contain two automobiles, one on top of the other.

The system as planned provides that two-thirds of the sewage of the city be intercepted and carried to the disposal plant by gravity; the other third to be lifted by pumps, each with a capacity of 7,500,000 gallons a day, from a point 13 feet below tide to the out-fall sewer, a height of 72 feet, including friction. This is an unusually heavy lift, especially as sewage is more difficult to pump



Branches Joining Five-Mile Sewer in Baltimore's New Sewerage System.

than water. Three of these pumps are now ready for service in the pumping station, which is large enough to contain two more to be installed later. The foundations for these pumps are independent of the foundation of the building.

The difficulty of the construction work is doubled on account of having to build two complete systems of sewers and drains, which cross and re-cross each other at a thousand different places. The necessity for the double system is that the legislature requires every gallon of sewage taken into the sanitary system to be purified before discharging it into the Chesapeake Bay or its tributaries. It

Jointing Small Pipe Sewers in Baltimore's New Sewerage System.

was therefore of vital importance that the amount of sewage to be pumped and treated be reduced to a minimum in order to keep down the size of the sewers, pumping station, the disposal plant and the unnecessary constant treating and pumping of clear rain water.

The only way to separate the rain water from the sewage, was by the construction of two independent systems. Therefore, the sanitary sewers will take care of the drainage from bath-tubs, kitchen-sinks and toilets. The rain water will pass off through storm water drains by inlets at street corners. To install these two systems in the beds of streets of a city more than a hundred years old, in which a mass of pipes had been laid, but in which practically no space was left for the sewers or drains, brought the engineer face to face with a series of problems as complex as they were varied. If the sewers could be laid in the streets, matters would be simplified, but with an eye to saving money for the householder, who has to pay individually for the connections, the engineers selected the alleys.

In these narrow thoroughfares not only is there a lack of room, but the workmen are continually hampered by a constant surface flow from kitchen-sinks and bath-tubs, of leaking water pipes and old sewers. More than that, the new sewers pass close to old brick buildings on shallow foundations and the owners of these buildings are ever alert to find cracks alleged to have been caused by the new construction work. In this respect the engineers have been wide awake. They have a photographic department and before any excavations are made the walls of buildings along the line are carefully examined and wher-

ever a crack in the brick work is noticed, it is photographed. These photographs have played an important part in settlement of contentions of owners who have sought to blame the engineers for something for which they were not responsible.

In the section of the city around the water front the difficulties were materially increased by having to work below tide level and hundreds of feet of coffer-damming had to be built. The sewers completed and the sections under contract measure about 160 miles and a goodly portion of them are large enough to drive through in automobiles; indeed, not long ago the Governor of Maryland, the Mayor of Baltimore, the members of the sewerage commission and about fifty guests made such a trip from the outfall end, nearly six miles underground.

A peculiar feature in connection with the sewerage work is that the greater percentage of visitors are from out of Baltimore. Engineers from all parts of Europe and even China have visited the great disposal works and splashed through miles of mud to see just how the work is being carried on. A most important feature, from an engineering point of view, is the method by which the work has been divided into sections, each section being considered a unit.

The disposal plant is constructed on the unit system so that it may be added to as the sewerage system is extended. The units so far completed are sufficient to take care of a population of 75,000. The units will be increased until they can take sewerage from a million population.

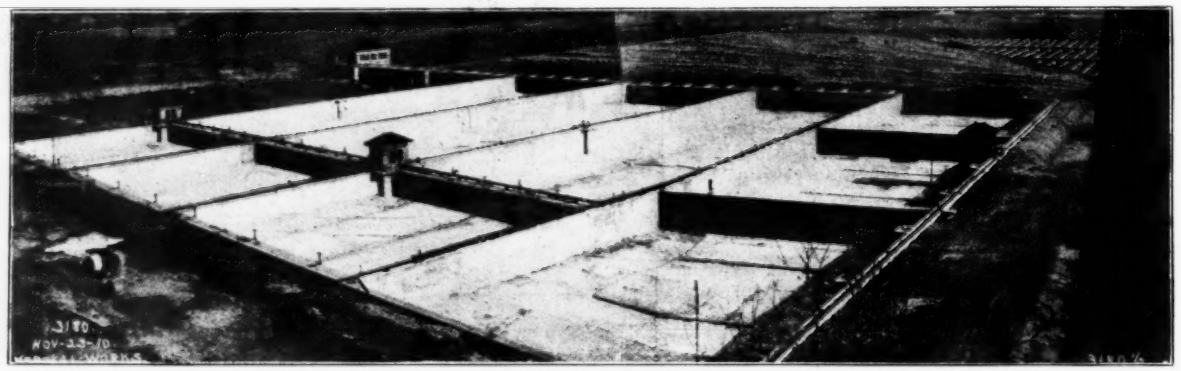
The method of treating the sewerage is as follows:

At the mouth of the outfall sewer are installed screens that catch such things as sticks, rags, etc., which will be removed and burned. The sewage then passes through the meter house, which measures its flow; then through hydrolytic tanks, about 450 feet long, requiring eight hours for passage—a sufficient length of time to allow the solids to settle, the liquids passing on through an intercepting channel to and through what is called the gate house, which distributes it to the stone sprinkling filters, located at a level of 15 feet below the hydrolytic tanks, giving a hydraulic head of sufficient force to spray the sewage over these stone beds through nozzles, or jets, spaced 15 feet apart. The hydraulic head will be controlled by butterfly valves, causing sprays to rise and fall, varying from close to the nozzles out to the limit of 15 feet, thus utilizing the entire surface of the stone bed, a large portion of which would be wasted if the sprays were stationary. These nozzles will throw a square spray, thereby saving additional space which would be lost if the sprays were circular, as where circles touch there is a lost triangle.

The spraying of the sewage through the air is essential to the aeration and purification of the sewage. As the sewage falls on the stone beds it trickles down through 8½ feet of broken stone, varying in size from 1 inch to 2½ inches. The passing of the sewage through these beds forms a gelatine-like film on the stones, in which certain bacteria multiply in the sewage.

On reaching the bottom of the stone beds, the sewage is practically pure. It is then carried by intercepting channels to a central channel under the stone beds, which finally delivers the purified sewage to the settling basins where it requires three hours to pass through. These settling basins are not for the purpose of causing additional purification, but to clarify the fluid, as there are certain mineral substances in the sewage which the bacteria in the stone beds do not annihilate, such as are found in the Mississippi river water, which is muddy, but not injurious to drink.

The sewage then passes with a drop of 18 feet to the power house, in which turbines are placed, operated by the flow of the sewage. They in turn run dynamos which generate electricity, giving power to light the plant, run the sludge pumps and lift the clarified sewage to a water tower for flushing purposes. In other words, by the simple gravity flow of the sewage, it is purified and power is obtained to light and run the plant at practically no cost.



The Baltimore Sewage Disposal Plant. Sludge Tanks in the Front and Filters in the Background.

Piker Finance.

Scott—Jones says that he cleared between five and six hundred on that stock deal of his. I wonder if it's so.

Mott—Oh, yes, he made between $5 and $600. The exact amount, I believe, was $8.75.—Boston Transcript.

Lawn Economics.

"I note," says the sage, "that you allow a sprinkler to spray water upon your lawn almost continuously."

"Yes," said the native. "We do that to make the grass grow."

"But the other day I saw a man pushing a clicking contrivance over the lawn, and"—

"Oh, yes. That was a lawn mower."

"And what is its purpose?"

"Why, it cuts the grass."

"Then why do you put water on it to make it grow if you simply cut it down as fast as it comes up?"—Judge.

The Steam-Loop and Its Uses in a Power Plant

By Thomas Tait

There is a growing demand for some device which will return the water of condensation to the boiler automatically, and which will require practically no attention, such as is necessary with the use of steam-traps. This device will be found in the steam-loop, which practically returns the condensation at boiler temperature.

The steam-loop is viewed by the average steam-fitter with distrust, as to him it appears to be clothed in mystery, which is not the case.

It is the very acme of simplicity, as it contains no moving parts; it is rapid and positive in operation; and its economy and efficiency unquestionable.

It can be used to bleed main steam-line at entrance of steam to engine, or after the steam is used, in caring for condensation from jackets, coils, tanks, etc. Dry steam will aways be secured by its use, and will often do away with traps and pumps which require attention they too often do not get, and will save in attendance and running expenses, and is a safeguard against water in cylinders, which often damages expensive machinery and causes costly and provoking shut-downs of the plant.

The steam-loop is regarded by many as a device of late years, which is not correct, as it has been in operation prior to the year 1880, and where once installed, seldom has been discontinued.

When the statement is made that a small pipe can be run from a steam-pipe back to the boiler, which will carry a current of water and steam back to the boiler against several pounds difference of pressure, and often times up hill, it would look as though some clear explanation were necessary for this seemingly impossible statement. This is what causes the steam-loop to be viewed with distrust.

A simple statement of its operation is, that just as steam flows from a boiler to an engine because of the drop in pressure, so will steam flow from the steam pipe or separator

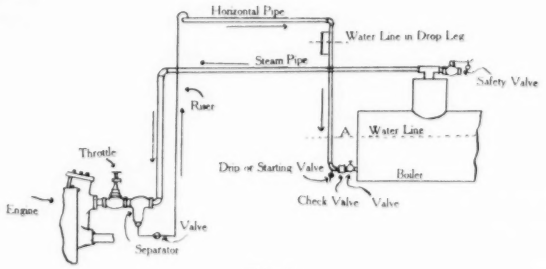


Fig. 1.

through a drain-pipe to a point where there is a further drop of pressure. If now it is desired to return the condensation to the boilers, the place to which it flows must have its pressure reduced and be high enough above the boilers to enable the water to run back to the boilers by gravity against the difference in pressure.

The system resolves itself into a small pipe, draining steam, vapor and hot water, and rising to a point where a slight condensation due to its exposed surface, or a lowering of the pressure by other means, lifts the steam, and with the steam the water, and returns the water to the boilers by gravity.

For a more detailed explanation, we will refer to the simple forms shown in Figures 1 and 2. We will assume 100 pounds pressure on the boiler, 94 pounds at the engine, and 40 pounds in the drop-leg of the loop. From this it will be seen that there is a difference between the pressure in the boiler and in the drop-leg of 6 pounds. A column of water in the drop-leg standing 14 feet above the level of the water in the boiler provides a hydrostatic head which will balance the pressure differences.

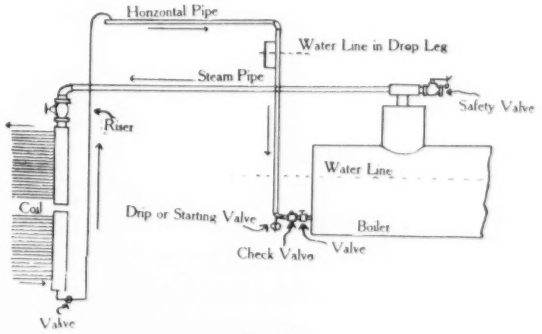


Fig. 2.

The condensation of steam in the horizontal pipe and consequent slight drop in pressure causes a column of mixed vapor, steam, spray and water to rise rapidly to fill the volume and restore the pressure. The mixture, being much lighter than the solid water of the drop-leg, rises much faster. By this process the riser will empty its contents into the horizontal pipe, and from here on, there is a free run to the drop-leg and into boiler. In using the steam-loop where many drainage pipes are connected to many boilers and general conditions are more varied, some method other than the simple one of radiation may be found necessary to secure the necessary condensation and consequent decrease in pressure at top of loop.

Figure 3 shows such a method, where the pipe E takes the drainage from separator, steam-headers, or any suitable place in live steam-pipe and runs to receiver A, connection with which is made through suction tee L. The pipe E maintains nearly the boiler-pressure at the receiver A, and helps to draw the drainage from the header E-2, which received the drips from all secondary sources through the pipes E-3.

The receiver A, is placed below the lowest point to be drained and serves as a storage for large or unusual quantities of water, and enables the riser C to act at a constant rate independent of variable discharges into the receiver A.

The condensed water and vapors are carried up with the steam through the riser C to the discharge chamber B. The purpose of the discharge chamber is to give the water a rapid and easy start down the drop-leg to the boilers.

The slightly lower pressure at the discharge chamber necessary to secure the lifting of the mingled steam and water through the riser C, instead of by condensation in the horizontal and the reducing valve P-1, which connects the discharge chamber B with any point where a

small quantity of steam can be economically used, as in a heater, radiator or condenser, again, a three way cock, shown at P-2, can be used in such a way that it will shut out the valve P-1, and connect the pipe P to the discharge from the feed pump, so that a small spray of water is forced into the discharge chamber.

A starting valve for the initial blowing out of air is shown in each cut, and also other valves, which are used as varying conditions require.

In brief, the above may be summed up into the statement that a decrease of pressure in the horizontal pipe or the discharge chamber, provides similar effects on the contents of the riser and drop-leg, but in degree

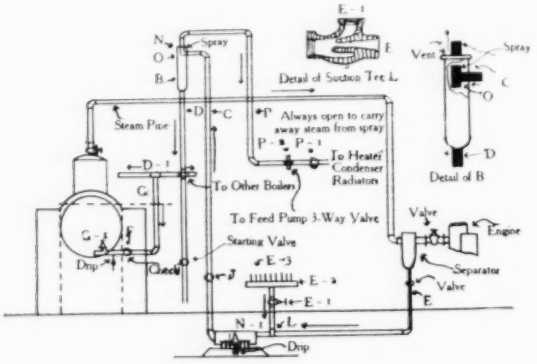


Fig. 3.

inversely proportional to their densities. When the necessary difference in pressure at the high point of loop is maintained at a constant rate, the drop-leg column reaches a height corresponding to this constant difference, and stays there. Thus the loop is in full operation, and will circulate as long as the steam is on.

After the principles which underlie the action of the steam loop are fully understood, its valuable features become apparent, and as it is very easily installed, it will be an easy matter for the doubtful one to convince himself of its usefulness. More could be said on this, but the above should be of value to those who install and operate power plants with safety and economy in view.

THE SEPTIC TANK SYSTEM OF WASTE DISPOSAL.

By F. W. Tower, Plumbing Inspector, Springfield, Mass. Read at a Recent Meeting of the New England Plumbing Inspectors' Association.

The Septic Tank System refers to a system that promotes putrefaction by means of animal bacteria called "aerobes," which act upon the contents of a sewage tank or cesspool and change the conditions of the sludge into a less obnoxious matter.

The most marked feature of the water carriage system is the great dilution which the organic matter undergoes.

The volume of sewage is practically equal to the water consumption.

The waste matter increases the volume very little, one pound in 120 gallons, is organic matter, to remove and destroy which is the purpose of the disposal plant.

This one pound of organic matter with its 120 gallons of water is all carried by the house drain to a suitable place, the distance from the house varying with conditions, and collected in a chamber called a "septic tank."

The tank should be made of such size that its contents will be changed once every 8 to 12 hours, that is its size must be such that the quantity of waste delivered into it would fill it if empty in the stated time.

The temperature of the water is preferably not colder than about 55 degrees F. to favor the conditions for bacteria propagation.

In the complete reduction of sewage by the septic tank method, two forms of bacteria are developed, "anaerobic" and "aerobic." Air and light retard the multiplication of the first of these.

The second requires oxygen (air), and rapidly multiply in the open air. These bacteria attack the solid organic matter which is discharged into the first or grit chamber.

After a suitable interval, usually 24 to 36 hours, the matter, which is considerably liquefied, overflows into a second or settling chamber, where light, air, and agitation are absent, which rapidly develops the bacteria called anaerobes. These not requiring air or light attack the remaining solids and rapidly remove all gases and purify the liquid mass to a great extent.

The more complex of these solids are converted into simpler compounds, the ultimate result of the decomposition being the production of ammonia, carbonic acid gas, hydrogen, etc.

The action of the "septic tank" is bacterial and not chemical.

Anything of a metallic nature will not be affected, and such material will have to be removed occasionally.

It takes some time for bacteria to breed in sufficient numbers to do efficient work and they should therefore be undisturbed.

Both inlet and outlet of the tank should be arranged to be below the surface of the contents when the tank is full, so that the scum which gradually forms on the surface will not be disturbed by the entrance or outflow of matter.

This scum resembling wet ashes helps to retain heat, and exclude light and air from the mass, all favoring the desired result.

The bacteria necessary to the process are always present in abundance in fresh sewage, and no preliminaries are necessary for the operation.

The purification process is somewhat difficult to define, being partly a straining process but chiefly an oxidizing process of organic matter accomplished through the agency of bacteria.

Warm weather increases the action of the anaerobic bacteria.

No septic tank shows good results when first put in operation, as the bacteria will have to be cultivated from six to twelve weeks if the plant be a large one.

The construction of the septic tank to be effective, should contain at least three compartments.

The first is the grit chamber, where the most important action takes place, and where the bacteria requiring the oxygen of the air perform their functions, acting upon the organic matter in solution and assist oxidization.

The second compartment is the settling chamber, where the bacteria do not need air or light to perform their functions to liquefy, still further, the matter, and also change it into a gaseous condition.

The third compartment is the discharge chamber from which liquids may be disposed of by several methods such as sub-surface drains, irrigation, or filtered into a well specially prepared from which the contents may be pumped.

All the chambers should be water-tight. The object of these successive purifying operations is simply to get

the sludge or solid into the form of pure water which can be discharged on the ground without producing bad results.

The final disposal where made into an underground system of distributing pipes is an entirely satisfactory method where the solid is dry and of a sandy nature.

In discharging into sub-soil systems it is well to know that the bacteria existing in the soil and that act upon the sewage are most numerous near the surface and decrease rapidly as the depth increases, and at a depth of five feet bacterial action practically ceases.

When the soil is wet, heavy or of a clay nature, the final disposal of an underground leeching system cannot be employed effectively, as the liquids have no opportunity to become purified by filtration through the soil, but are simply deposited to saturate the soil, the result of which grows constantly worse. When these conditions prevail, the discharge chamber may have its contents siphoned into a filter constructed below its lowest level, of broken stone and gravel.

From this filter the partially purified water is conveyed to another "sand" filter also located underground below the level of the first filter, and from this point the liquid is pumped on to the surface of the ground.

It is necessary to pump the filtered water from the second filter at stated intervals or the water would back up in the first filter, and thus defeat the purpose for which they are used.

The filtering material will need removing occasionally, as it will become filled with impurities.

By proportioning the size of the tanks, or as capacity for say thirty-six hours, septic action will take place without odors.

The daily amount of sewage may be obtained by multiplying the average number of people housed in the building by 30, thus obtaining the number of gallons discharged daily into the plumbing system. The size of the tank is determined by deciding on the duration of time the liquids are to be allowed to remain in the tank.

It should be large enough so that the sewage in passing through it has a slow current.

This gives time for the bacteria to multiply at a very high rate and decomposition is thus effected.

The product is defined as a harmless, colorless and odorless liquid.

This system prevents the means of securing a system of sewage disposal under difficult condition, and, while it requires more or less attention, will not ordinarily be employed when other methods can be used.

CONTRACTS AWARDED.

Rochelle, Ill.—A. M. Pentz has secured the contract for installing the plumbing and heating plant in the new Baxter & Hamlin building, now in course of construction on Washington Street.

Dallas, Tex.—The Park Board has awarded the plumbing contract for the Fair Park comfort station to Sanguinett & Bond at $3,259.

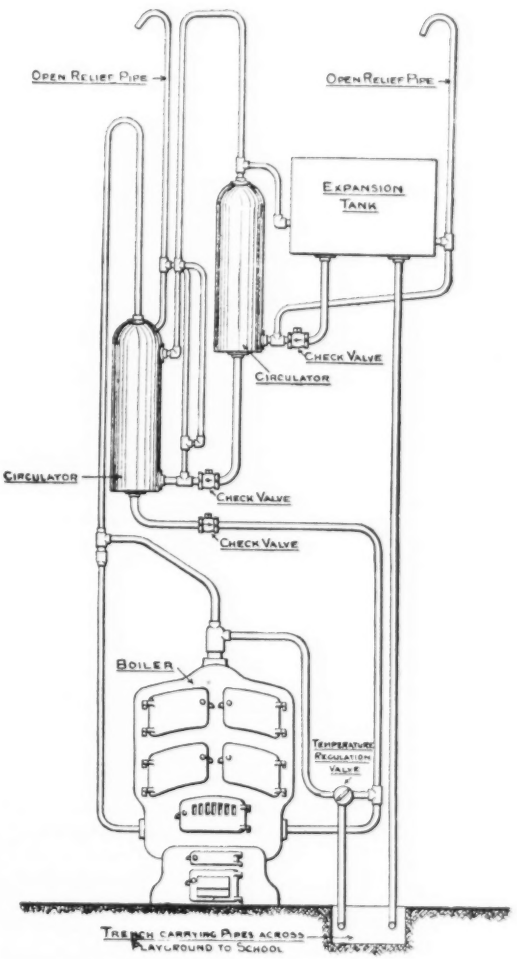
Jackson, Miss.—Contract for the heating, lighting and plumbing in the new Peabody educational building at Oxford, Miss., has been awarded to the Luderbach Plumbing Co. of this city.

Cleveland, O.—A. J. Penote of this city has secured the plumbing contract for a store and apartment building to be erected for the Diebolt Brewing Co.

Baltimore, Md.—Articles of incorporation have been filed by the William A. Keen Plumbing & Heating Co. The officers of the company are: William A. Keen, Leonard F. Fowler and H. Hampton Linthicum.

AN ENGLISH LOW-PRESSURE HOT WATER HEATING SYSTEM.

Among the difficulties inseparable from ordinary methods of hot water heating may be mentioned the installing of an apparatus which requires the sinking of a chamber below ground level, so that the boiler heating pipes and radiators may work with some sort of satisfaction. This sometimes necessitates the use of—and always in buildings covering more than average area—circulating pipes of large diameter, causing the apparatus to look cumbersome and unsightly. In such cases the pipes must be carefully laid, so as to avoid dips or traps, and, if possible, much trench work. The larger the



An English Low-Pressure Hot Water Heating System.

pipes the greater the quantity of water and longer the time to get heated, especially in the more important installations. And it often happens in laying out the ordinary low-pressure apparatus to best advantage that obstacles stand in the way which require unnecessary waste of time, patience, and consequent expense to secure a proper circulation of the water throughout the apparatus and meet architectural requirements.

Such difficulties as these are quite avoidable by the adoption of the "Pulsial" system of heating building, says "The Sanitary Record," of London, England. It has the

advantage of simplicity in construction, requires neither technical knowledge nor skilled attention, can be regulated by means of valves, and while being designed to ensure great economy of fuel, possesses heating surfaces that do not burn dust and dirt which happens to lodge thereon, such dust and dirt when allowed to fume and vitiate the air often being subtle cause of injury to health.

The "Pulsial" system (Bean's and Walton's and Walton's Patents) means that the hot water is circulated in continuous pulsations. It is evident, therefore, that the compulsory method of circulation is not like that effected by the difference in the weight of two columns of water arranged as "flow" and "return." The circulating pipes and radiators of this system of heating can be disposed at will, and the water forced through them with intensive flow, even when the pipes are of very small diameter. It is claimed for it that any hot water boiler of fairly good type may be used, and placed at any level in a building with a chamber suitable for its reception. An ordinary open ball-cock supply tank effects the flooding in the whole of the system. The water brought to boiling point is raised through a pipe from the boiler, and converted into steam at a level well above it, the steam never exceeding in pressure that governed by the head of water in the apparatus, in calculated relationship to the supply tank. An ingenious arrangement of siphon pipe in one displacer is employed as a cut-off for the steam in such a manner as to cause alternative displacement of water and condensation of steam, with consequent refilling of the "Pulsial" displacers with water. The whole of the circulating pipes, radiators, boiler, and displacers form one connected open-bore system, under atmospheric pressure, only three self-acting freeway check-valves being used to prevent displacement in the wrong direction. The apparatus is free from complications, entirely automatic, perfectly noiseless in working, and requires no more attention than an ordinary low-pressure apparatus, which allows of any desired temperature to be obtained in the circulating water. (See illustration.)

Some advantages of this system of heating by low-pressure hot water may be briefly enumerated. Sunk stokeholds are not necessary. Regarding small diameter pipes, the circulating mains are at least reduced one quarter the size of those required with the ordinary low-pressure system. Wrought iron pipes instead of cast iron can be cheaply and neatly used owing to their small diameter. No risk of leakage or breakage of pipes exist owing to the use of wrought iron pipes. Pipes may be run at will above or below the boiler, dipping or rising in any direction or manner desired, and thus often avoiding a large amount of trench work. Highly efficient heating is effected by the rapid flow of water through the apparatus. Long-distance range owing to the effective method of circulating the water through the apparatus; the length of the mains may be greater than an ordinary apparatus. This is of much importance where a central boiler cannot be provided or in buildings covering a large area. Then its absolute adaptability to the architectural features of any building, however difficult or complex the problem of heating may appear. Not only can the temperature of the heating surfaces and radiators be regulated with valves by controlling the speed of flow, as in ordinary apparatus, but the actual temperature of the water leaving the boiler can be regulated by a valve from a maximum to mere lukewarmness. Then the boiler may be of any standard hot-water type (either cast or wrought iron), while the circulating apparatus is free from any part which can possibly get out of order or need adjustment.

The system applies to any existing building, and the apparatus can be installed with little trouble and small incidental cost. Because the mains can be in all cases run as desired, boilers and radiators are easily placed in any available position. The saving gained through the reduction in size of the circulating mains well offsets the outlay for displacers and pipework in connection with the system; but this is not at any time costly compared with the advantages gained in one way and another, particularly in consumption of fuel, and the fact that no skilled labor has to be paid, even for the little attention required. What is of some importance in connection with the "Pulsial" system of heating is that the apparatus, being provided with free air or relief pipes, as required by the London County Council regulations, is accepted by fire insurance companies as "low pressure."

AN ATTRACTIVE PLUMBING ESTABLISHMENT.

In this column is reproduced a photograph of the shop and display room of the A. J. Eckert Co., 103 N. Lake Avenue, Albany, N. Y., showing Mr. Eckert in the doorway (with cap). This company is enjoying a very good business at the present time, largely due to Mr. Eckert's genial manner together with the company's reputation for

A. J. Eckert Co's. Plumbing and Heating Establishment, at Albany, N. Y.

good work. One of their largest contracts is the plumbing in the Albany high school, amount approximately $27,000; another, the plumbing in the state prison at Comstock, N. Y., amount of contract $24,000. Mr. Eckert is a master plumber with up-to-date ideas, his establishment being fully equipped with modern machinery and he uses an automobile for delivery purposes.

One Difference.

May—"What's the difference between 'lectricity and lightning?"

Tommy—"You don't have to pay anything for lightnin'."—Boston Transcript.

THE METAL MARKET

NUMEROUS PRICE CHANGES.

Seldom have there been more price changes announced in so short a space of time as since the 20th of July. Last week steel pipe was advanced $2 per ton; boiler tubes, $2 per ton; cold-rolled shafting, $1; rivets, both structural and boiler, $1; railroad spikes, $1 a ton; bars for concrete reinforcing and other merchant uses, $1 per ton, and plates are likewise $1 a ton higher, although no official announcement has been made. After a period of dullness lasting for many months the Western markets for pig iron have developed considerable animation and in the St. Louis district some large sales have been made. In the Cleveland market prices have advanced 50 to 75 cents per ton, and in Cincinnati there are a number of orders for 500 to 1,000 tons which will be filled in the very near future. The only reason they have not been filled heretofore is because of the uncertainty of the coke situation, but since this has been cleared up the market is a great deal firmer and the demand far more active.

Cast-iron pipe is in exceptionally good demand from water companies all over the country. Most of this takes the shape of inquiries for small shipments of two to three cars going to villages either for new development or extensions to existing systems, but there has never been a time when so many small water companies were being organized or other small ones being extended as at present. Cast-iron soil pipe has likewise shown considerable strength because of a large inquiry. Quotations for pig iron are as follows:

No. 1 Northern foundry, New York	$16.00 to $16.50
No. 2 Southern foundry, Birmingham	12.00
No. 2 Northern foundry, Chicago	15.00
No. 2 Southern foundry, Cincinnati	14.75 to 15.00

THE OLD METAL MARKET.

Dealers' buying prices in Chicago are as follows:

Heavy copper	$14.50
Light copper	13.25
Heavy brass	9.50
Light brass	7.75
Heavy lead	4.25
Tea lead	3.75

THE COPPER MARKET QUIET.

Consumers of copper in this country have not purchased as much metal as usual during the week and the inquiry from selling agents in Europe has not been as large as most of the large mining companies thought it would be. The uncompromising attitude on the part of sales managers may have something to do with the slackness of trade, for they are all asking 17.75 cents for Electrolytic, even resale lots are hard to find at the quoted price of 17.67½ cents. The largest consumers in Europe are well supplied for several weeks, at least, but there are many small melters who will have to have some copper in the near future and these usually buy in the American market. As far as the situation on this side of the water is concerned there is no anxiety for there are a number of them who have not covered their requirements for September delivery and purchases for October shipment have been the exception rather than the rule. With the publication of the statistics by the Copper Producer's Association it is expected that the volume of business will increase.

OBITUARY.

William S. Verity, Jr.

William S. Verity, Jr., from 1893 to 1911 manager of the Standard Sanitary Mfg. Co's. Chicago office, died at his home, 2758 Washington Boulevard, Chicago, on Saturday morning, August 3rd, in his 52nd year. Mr. Verity was the son of William S. Verity, Sr., Park Ridge, Ill., one of the nestors in the Chicago plumbing trade, and he secured his early business training in the service of the L. Wolff Mfg. Co., Chicago. He left this company to accept the management of the Standard Sanitary Mfg. Co's. Chicago office in 1893, a position he held until February, 1911, when ill health forced him to retire. He was a member of several fraternities, which as well as the plumbing trade of Chicago were well represented at his funeral, held last Monday afternoon. The services were held at the Central Masonic Temple, and the interment took place at Rosehill cemetery. Francis J. Torrance, first vice-president of the Standard Sanitary Mfg. Co., came from Pittsburgh to attend the funeral. Mr. Verity is survived by his wife, his father and three brothers.

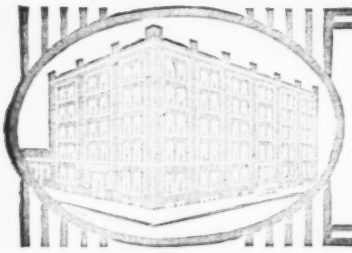
John Wesely.

John Wesely, manager of the plumbing specialty business at 3126 South Canal Street, Chicago, owned by his father, Charles Wesely, was drowned at Twin Lakes, Mich., on Monday, July 29th. He went to that summer resort the day before, with his wife, for a vacation. Shortly before noon on Monday he decided to go swimming. Having rowed out near the center of the lake, he dived from the boat. When he rose to the surface he called for help, but no one was near enough to reach him in time, and he sank again. It is believed that the cold water brought on an attack of heart failure. The body was recovered. He was only twenty-six years old.

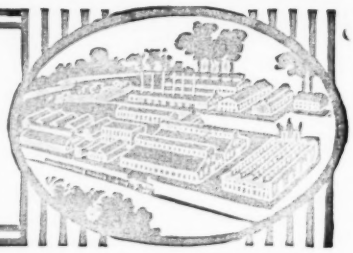
MODERN OFFICE OF THE HUGHES HEATING & PLUMBING CO.

The illustration in this column was reproduced from a photograph showing W. W. Hughes, the popular Minneapolis plumber and steam fitter in his establishment at 1514 E. Franklin Avenue. Mr. Hughes attended the convention at Salt Lake City and no doubt his many friends among the delegates will be interested in a view of his modern place of business. Mr. Hughes is a strong advocate of doing first class work and charging proper prices for it.

The Up-to-Date Office of Hughes Heating & Plumbing Co., in Minneapolis, Minn.



News of Interest Among the Wholesalers and Manufacturers



HAVE INCREASED THEIR PLANT'S CAPACITY FIFTY PER CENT.

Vaile & Kimes, of 8 Canal Street, Toledo, O., have made several improvements and additions to their factory, which has increased its capacity fully fifty per cent.

ENAMELED TANK CO. RESUMES FULL OPERATION.

The damage done to the plant of the Enameled Tank Co., Kalamazoo, Mich., by fire on July 4th, has been repaired, and the company has resumed full operation in all its departments.

STANDARD BRASS WORKS TO BUILD NEW ADDITION.

Plans have been completed for the erection of a two-story brick building by the Standard Brass Works, Detroit, Mich. The estimated cost is $24,000. Work will begin on the building in the near future.

WILL MANUFACTURE VENTILATING APPARATUS.

The Universalist Ventilating Co., Augusta, Me., has been incorporated with a capital of $2,000, to engage in the manufacture of ventilating apparatus. The officers of the company are: R. S. Buzzell, president; L. J. Coleman, treasurer.

WILL MANUFACTURE GAS HEATING SYSTEMS.

The Los Angeles Vacuum Gas Heating Co. is the name of a new enterprise which has just been organized in Los Angeles, Cal. The capital stock is placed at $150,000. The company is to manufacture a new system of gas heating, invented by Alcon Rector, who arrived from Pittsburgh two months ago, and has succeeded in interesting capital in the enterprise.

NOW WITH THE RUUD MFG. CO.

The Ruud Mfg. Co., Pittsburgh, has secured the services of G. C. Mahaffey, formerly of the Sanitary Co., Cleveland. The company has opened a display room at 428 Penn Avenue, Pittsburgh, in charge of Mr. Mahaffey who will be assisted by Wm. Barr and John C. Dyer, and will have charge of all the business of the Ruud Mfg. Co., in Allegheny County, Pa.

WILL BUILD A MODERN NEW PLANT.

Having outgrown its present quarters, the Hart Mfg. Co., 1350 E. Third Street, Cleveland, O., has completed plans to erect a new modern two-story plant on East 20th Street, for the manufacture of die stocks. The contemplated building will be about 150 x 250 ft. in size, of reinforced concrete construction. The plant when equipped with the necessary new machinery, will provide for more than double the present capacity of the company. Work on the building will soon be started.

PERSONAL MENTION.

The many friends of R. L. Gifford, president of the Illinois Engineering Co., Chicago, who was recently bruised in a railroad accident in the South, while on his way to his company's branch office in New Orleans, La., will be glad to hear that he has entirely recovered from the shock and his injuries. After the accident he proceeded at once to his home in Pasadena, Cal., where he has spent a couple of weeks. It is expected that he will return to Chicago about the middle of August.

* * *

James Hay, president of the Beler Water Heater Co., Pittsburgh, Pa., sailed for Europe on July 27, to be gone several months.

WILL MANUFACTURE PORCELAIN PLUMBING GOODS.

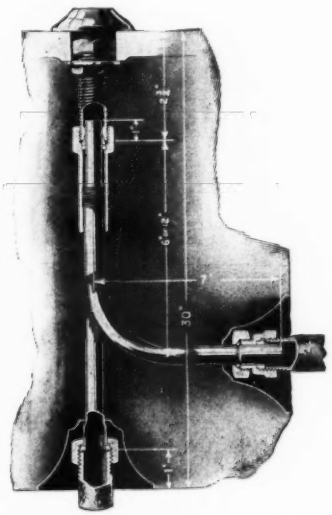
Richmond, Cal., will soon have another factory making porcelain plumbing goods. A new company has been organized for that purpose under the name of the Western States Porcelain Ware Works by three San Francisco men: R. J. Tyson, of the Seaboard Bank; C. P. Overton, of the Union Fish Co., and James Tyson, president of the Charles Nelson Co., and the capital stock is $100,000. W. Platz is to have charge of the works as general manager. The company will manufacture solid porcelain bath-tubs, sanitary ware and electrical fittings. There will be separate buildings and kilns for the different lines to be turned out. The plant will be erected on the Santa Fe road at the northern outskirts of the city.

A NEW FLOOR AND WALL-BASIN SUPPLY PIPE.

Among the numerous new devices shown by the H. Mueller Mfg. Co., of Decatur, Ill., at the recent convention of the National Association of Master Plumbers in Salt Lake City, was a new floor and wall-basin supply pipe, which is shown herewith. This pipe permits a rigid connection at the floor or wall line, and has a wide range of adjustment because of a multiple thread at the shank end. Its advantage over the slip joint is the fact that a blowout is not possible. Plumbing inspectors are urging the abandonment of the slip joint and the adoption of a rigid connection, and this new device is said to meet every requirement. The illustration shows at a glance the advantages of this new supply. In mak-

ing a floor connection the supply is pushed up into the shank of the cock and the lower end placed on the iron supply pipe and fastened with a nut, making a perfectly solid connection. Then the connection is completed by tightening up the nut on the shank of the basin cock. Here is where the advantage of the multiple thread comes in. The long thread gives an adjustment of an inch and a half in length, up and down. The whole operation requires but a few moments.

The wall supply is installed in the same way. It has the multiple thread features at the basin cock. The supply end passes into a slip joint nut. With a plier having a raised ring in the jaw, an indention is made around the pipe close to the slip joint. A brass ring fits into this indention and is held in place by another nut, which when drawn tightly locks the supply pipe in an immovable position. The locking ring can be used on the floor supply if desired. The nuts on both the wall and floor supplies are concealed, and the whole job has a neat appearance. These supplies are made of ½-inch O. D. annealed seamless brass tubing, or ⅜-inch



A New Floor and Wall-Basin Supply Pipe.

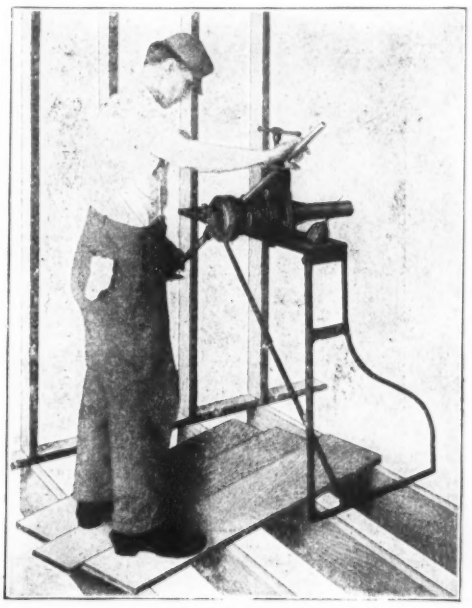
or ½-inch iron pipe size if desired. The floor supply measures 27¼ inches from the bottom flange to the top of the tubing and the wall supply 7 and 13 inches from the center of the horizontal pipe to the top of the tubing.

ISSUES HANDSOME NEW FOLDER.

The Spencer Heater Co., of Scranton, Pa., has just issued an attractive folder entitled "The Spencer Heater on the Job—Some Actual Savings and Why." This folder is issued as a follow-up of a catalogue of the new Spencer Sectional Hot Water Heater, which was recently mailed to their customers.

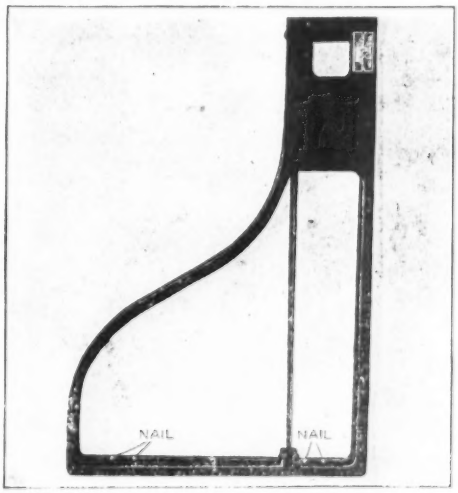
FOLDING PIPE VISE STAND.

A useful and practical device for plumbers and steam fitters has recently been placed on the market, Smith's folding pipe vise stand, bearing out the old adage that "necessity is the mother of invention." The inventor of this stand realized the time wasted by mechanics in setting up a bench on the job, also the destruction to property in getting the "make-shift" nailed to the floor. After considerable time and study, Smith's pipe vise stand is the result. It is made for cutting pipe any size from ¼ to 2 inches, and is so constructed that it will take care of any kind and size pipe vise. It can be folded together, carried from one job to another, and set up with four eight-



Smith's Folding Pipe Vise Stand, on the Job.

penny nails, ready for work in a moment's time. It is built of malleable casting to insure durability. The stand complete with pipe-bender weighs 34 lbs. One of the accompanying illustrations shows a man in the act of cut-



Smith's Folding Pipe Vise Stand, Folded Together.

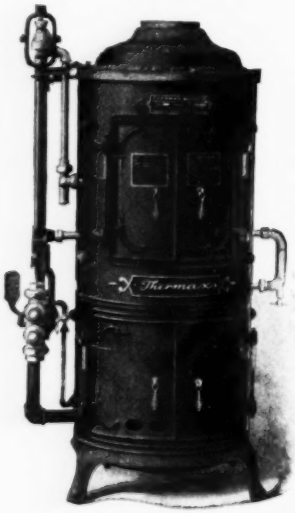
ting and threading pipe, and the other shows the stand folded together ready to be taken from one job to another. Full particulars in regard to this stand can be procured by writing the manufacturers, The Strand Heater & Mfg. Co., 1224 St. Clair Ave. N. E., Cleveland, O.

THE THERMAX INSTANTANEOUS GAS WATER HEATER.

An unusually attractive catalogue has just been issued by the National Stove Co., of Lorain, O. On the front cover, a reproduction of which is illustrated herewith, appears in artistic lettering the word "Thermax." The catalogue is very well written and beautifully printed in two

Front Cover Design of the National Stove Co's. New Catalogue.

colors with illustrations of the Thermax instantaneous water heater. One of these illustrations is shown on this page. Among the many favorable points brought out in connection with this heater is the unique feature of triple automatic water control. In explaining this automatic

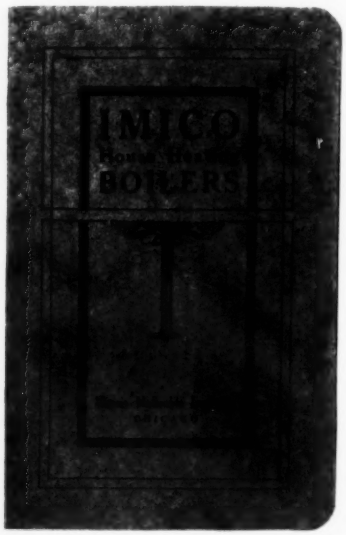


The "Thermax" Instantaneous Water Heater.

water control the manufacturers state: "The Thermax is the only heater with triple control. It will supply the household with quicker hot water because it restricts the water until fully heated. It will supply more hot water because the water control being automatic, it opens wide to any quantity of water, often exceeding its guaranteed capacity. It will give hotter water because the water control will hold or restrict any that is below the required temperature. It will save the gas, as it holds the water until the heating operation is completed. Heat units are not wasted by being carried away when the faucet is first turned on. The marvelous water control does that. The Thermax will last a lifetime, as all parts are simple and made of the best material by experts. It does more work than any other heater. Triple control does that. In short, it exceeds all other heaters, because it is the latest idea—gushing hot water." The manufacturers will be glad to send this attractive catalogue to interested parties upon request.

ILLINOIS MALLEABLE IRON CO. ISSUES NEW CATALOGUE.

An interesting catalogue of "Imico" new house heating boilers is being distributed to the trade by the Illinois Malleable Iron Co., of 1801 Diversey Parkway, Chicago. This catalogue, front cover of which is reproduced in this column, describes in detail the construction, circulation, heating surface, ratings, etc., of Imico



Front Cover Design of the Illinois Malleable Iron Co.'s Catalogue.

boilers. In this book are shown illustrations of Imico sectional water and steam boilers, sectional heaters, Diamond water boilers, Illinois water and steam boilers and water heaters, garbage burner and hot water heater, laundry water heater, Chicago heat regulators, "Aetna" hot water boilers, "Eureka" circulation fitting and "Perfection" adjustable floor sleeve. Interested parties can obtain copies of this catalogue by addressing a card to the Illinois Malleable Iron Co.

Plainfield, N. J.—The American Heating & Plumbing Co. has recently been incorporated with a capital of $60,000, to engage in a general plumbing business. The incorporators are: Arthur H. White, T. J. Van Wagner and Samuel T. Williams.

Chief counsel—"The first thing to do is to get at the root of this trouble."

Associate counsel—"The root of the trouble is the late Mr. Bigwad's fortune."

Chief counsel—"Exactly; and we must get at it."—Pittsburgh Post.

News of the Plumbing and Heating Contractors

Reports of the Week from Many Different Cities Show Both Business and Personal Activity in the Trade

NEWS FROM THE PACIFIC COAST.

San Francisco.

Business conditions on the Coast continue to improve steadily in most all lines. The market seems to be expanding sanely and conservatively and there is a notable absence of sensational boosting this summer in the general publicity work. While in the city of San Francisco the industrial development is not very great, the growth of the smaller suburban cities in the past year is most marked on account of numerous new industrial enterprises which have been launched. The tributary territory of San Francisco is fast being developed along modern lines and this means a great stimulus to the jobbing interests here.

Plumbing supply dealers report that their sales have reached a greater volume this season than for several years past and the outlook for a brisk fall trade is exceptionally bright on account of the continued activity in building operations. Jobbers enjoy a fair profit on some lines of merchandise, but in most lines of fixtures the market is somewhat demoralized by reason of the price cutting. At present jobbers are ordering large quantities of pipe as the manufacturers' agents will take no contracts for extended delivery and shipments are very slow. The new ruling on freight rates, which will go into effect on September second will mean an advance of from fifteen to twenty per cent on enameled goods and this fact is also causing jobbers to order more heavily than usual in the commodities affected.

Robert Dalziel, jr., the local plumbing and heating contractor, and S. F. Gemmell, a sanitary inspector, were injured in an automobile collision in Oakland on July 26th. Both were thrown out of their cars and Mr. Dalziel was severely bruised on the head. Neither person received dangerous injuries.

The Robert Dalziel, jr. Co., the low bidders for installing the power plant in the State Hospital at Patton, Cal., have been awarded the contract. Amount $23,127.

Neil A. McLean is the low bidder on the plumbing, sewer work, gasfitting and vacuum cleaning system for the new State Armory at San Francisco. Amount $11,000. The same contractor bid low on the steam heating and ventilating work. Amount $12,000. The bids were opened on July 29th.

The Central Electric, Plumbing & Heating Co. has been awarded the plumbing and heating work on the seven-story and basement steel frame and brick hotel building at Sixth and Mission streets, owned by Edward H. Mitchel. Amount of contract, $1,855. The steam heating contract on the same building was awarded to the General Engineering Co. Amount, $1,350.

L. Haws who has leased a storeroom at 2130 University Avenue, Berkeley, Cal., is preparing to open a modern plumbing establishment which he claims will be one of best on the east side of the Bay.

The Whiting & Mead Commercial Co., of San Diego, Cal., has bought out the City Wrecking and Lumber Co. and has established a planing mill and storage quarters at First and G streets. The concern is to carry a heavy stock of plumbing and hardware goods.

Gerardo Castro has opened up a new plumbing establishment and tinshop in the store formerly occupied by Charles Beck, the butcher, at Nogales, Arizona.

The plumbing and heating contract on the concrete hotel building on Grand Ave., between Eighth and Ninth streets, Los Angeles, has been awarded to Howe Bros. at $29,821. The building is being erected by the Los Angeles Cemetery Association at a total cost of $125,821.

NEWS FROM PHILADELPHIA AND VICINITY.

M. J. Kennedy & Co., 6313 Stenton Avenue, Germantown, Philadelphia, will install plumbing in the residence of Thos. Benard at Oak Lane and Thirteenth Street, Philadelphia. This firm also has the contract for plumbing in two houses at Haines Street and Stenton Avenue, Philadelphia, for P. Moylan.

M. J. Feeney, 6150 Lansdowne Avenue, Philadelphia, is introducing plumbing at the property on Forty-eighth Street and Haverford Avenue for the Church of Holy Comporton.

Flynn & Love, 1520 Sansom Street, Philadelphia, have the contract for plumbing in St. Vincent Home, Seventieth and Woodland Avenue, Philadelphia.

T. McCarthy, 4211 Woodland Avenue, Philadelphia, will make additions and alterations to the plumbing at 5702-26 Delancey Street for the C. E. Trust Co., Philadelphia.

Charles S. Menige, 1522 E. Passayunk Avenue, Philadelphia, will install plumbing in the residence of M. E. McMichar at the southwest corner of City and Lancaster Avenues, Philadelphia.

Thomas H. Hocking, 126 Columet Street, Philadelphia, is installing drainage systems at 5436-42 Ludlow Street, Philadelphia.

Weideman Bros., 3013 Kensington Avenue, Philadelphia, have the contract for plumbing in eight houses at Womrath and Romain Streets, Philadelphia, for H. Mathews.

W. H. Alexander, 5553 Spruce Street, Philadelphia, has the contract for plumbing in a new residence at Sixty-first and Christian Streets, for the Quaker City Realty Co., Philadelphia.

L. J. Craig, 328 Queen Street, Germantown, Philadelphia, will install plumbing in the new residence of A. Craig at Queen and Lawrence Streets, Philadelphia.

W. J. McCuliff, 5940 Haverford Avenue, Philadelphia, will install plumbing in ten new houses at Sixty-third and Market Streets, Philadelphia, for E. A. Carroll.

J. McCann, 210 West Dauphin Street, Philadelphia, will install the plumbing at 635 Erie Avenue, Philadelphia, for H. P. Schneider, owner.

G. A. Melling & Co., 4223 Frankford Avenue, Philadelphia, have been awarded the contract for plumbing in the residence of A. J. Gilmour, 1211 Arrott Street, Philadelphia.

C. E. Hartranft, 2007 W. York Street, Philadelphia, will install plumbing in the new residence of Mrs. E. Lamb at Sixth Street and Chelten Avenue, Philadelphia.

SOUTHERN NOTES.

The Master Plumbers' Association of Memphis, Tenn., has been reorganized and is doing good work this summer. Social features, boat rides, etc., receive attention along with the other work. The officers of the local chapter are: Jas. L. Evans, president; Martin Woods, vice-president; and J. F. Whittaker, secretary and treasurer.

Herbrick & Lawrence, of Nashville, Tenn., have the contract for the plumbing on the Christ Church at Nashville. They have also secured the contract for the plumbing in the High School building and in the Warner residence, to be erected on the Harding road.

John Goode has opened a plumbing business at 1306 Church Street, Nashville, Tenn.

Pritchard Bros. Co., of Memphis, Tenn., recently purchased a site on Madison Avenue in that City for $20,000, on which they will build a new home for their business.

The Postlewaite Plumbing & Machine Co., of Paris, Tenn., has succeeded to the business of Roe & Gilbert. W. B. Postlewaite is manager. He reports summer business exceedingly good

NEWS FROM NEW ENGLAND.

Massachusetts.

Brockton.—The contract for a steam heating plant for the Howard school was awarded, at a recent meeting of the Public Property Committee, to the J. J. Powers Estate. The contract price was $7,991. There were three bidders, the others being J. T. Corcoran $8,825, and J. E. Holland Co. $8,448.

New Bedford.—James F. Murphy, foreman of the plumbing department of the S. C. Lowe Supply Company for the past 17 years, has purchased the business. He will have his place of business at 26 Fifth street and do all kinds of plumbing work.

Fitchburg.—Employing plumbers report an unusual scarcity of workmen in the city at the present time. Several contracts have been considerably delayed by the inability of the master plumbers to secure competent help.

Easthampton.—The George L. Manchester Co., which two years ago purchased Newkirk's plumbing and hardware business, has already outgrown its quarters. It is now planned to erect a large building, 30x60 feet, in the rear of the present block, and install all the latest devices for a modern pipe shop.

Connecticut.

Willimantic.—The fire committee of the board of aldermen has placed a contract for new plumbing and heating in the fire houses with Fred W. Gerrick. He was the lowest of several bidders.

Bridgeport.—Edward Lynch, the Stratford Avenue plumber, has returned from a pleasure trip to Bermuda.

New Canaan.—The Henry Plumbing Co. has been awarded the contract for plumbing the new Silliman building.

Hartford.—During the first six months of the current year 252 plumbing permits have been issued in this city. A new tenement house law, requiring sanitary plumbing in all tenements, is mainly responsible for the large number of permits issued.

Bridgeport.—The H. D. Fitzgerald Plumbing Co. is to do the plumbing at the Hungarian-Greek church. A. E. Roberts has the contract for plumbing and furnace heating in a two family house for John Koestner on Hollister avenue. The contract for the plumbing and heating in the residence of Robert N. Perry, which is now being remodelled, has been let to R. T. Rock.

New Hampshire.

Keene.—Stone & Underhill, of Boston, have the contract for the heating apparatus for the new high school building. The contract price is $6,900.

NEWS FROM WISCONSIN.

Milwaukee.—A second public comfort station is to be erected in this city. The site for this station has been selected on the south side of the city, on a triangle bounded by Mitchell and Clinton Streets and Kinnickinnic Avenue. The plans for the station have been approved by the common council committee on sites and plans, and the common council has authorized the construction at its last meeting. The cost has been estimated by Bridge Superintendent Pinney at $2,000. Larger stations are being planned for Juneau Park and under the Grand Avenue bridge.

La Crosse.—The Thill-Manning-Whalen Co. has started work in connection with the contract recently awarded the concern for constructing sewer twenty-one blocks in length. The trunk main will be laid in Hagar street, and branches in Berlin, Avon and Rose Streets. Two hundred and fifty house connections will be laid in connection with this work. The extensions will cost $17,000.

Stoughton.—The annual meeting of the school board of this city was held here recently. At that time, the installing of a steam heating plant in the west side school building was discussed, and action thereon postponed until figures were secured. At the adjourned meeting it was learned that the cost would be about $10,000, and the board has plans under preparation for the construction of such a plant.

Milwaukee.—The Milwaukee Public Trade School for Boys has been opened with an attendance of forty students. The improvements, made necessary by fire several months ago, which have been completed at an expenditure of $115,000, consist of two complete wings of the main building. When the administrative and other buildings are completed, the cost will reach $250,000. One of the most important branches taught in this school is plumbing and gas fitting. James F. Perry is superintendent and James L. Cox is principal of the institution.

RHODE ISLAND MASTER PLUMBERS' OUTING.

The Rhode Island State Association of Master Plumbers held its thirtieth annual outing at the Warwick Club, Providence, R. I., on July 24th. Sixty-five members of the association, with their families and friends, were present and engaged in the festivities of the day, the principal feature of which was a shore dinner.

After the dinner had been disposed of there was a program of athletic events. The pipe race was won by Herbert Hutchison; the fat men's race by C. P. Brennan; and ladies' race by Mrs. G. Riccitelli. The prizes were furnished by the Providence Plumbing Co.

Among the members of the association present were First Vice President P. J. Murphy, of Newport; Treasurer T. J. Tierney, of Providence; Second Vice-President T. H. J. Nash, of Providence; Secretary Edward Barry, of Providence; and former President C. P. Brennan, also of Providence.

Guests of the day included the following representatives of the various supply houses: S. S. Freeman, of the Glauber Brass Co., of Cleveland; E. R. Russell, of the J. L. Mott Iron Works, of New York; P. B. McGinnity, of the United Brass Mfg. Co., of Cleveland; E. B. Reardon, of the M. Glauber Co., of New York; and E. H. Beede, of the Rhode Island Supply & Engineering Co., of Providence.

The committee in charge of the outing was composed of Edward Barry, chairman; Herbert Hutchison, Preston R. Walker and M. E. Murphy, of Providence, and Fred Macomber, of Pawtucket.

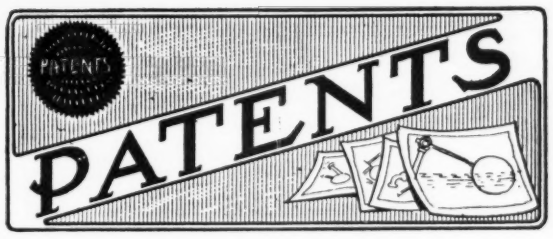
TENNESSEE MASTER PLUMBERS ELECT OFFICERS.

The destinies of the Tennessee Master Plumbers' Association for the coming year will be looked after by Frank Herbrick, of Nashville, president; and T. Cronlin, of Memphis, vice president. Secretary and treasurer and board of directors are to be appointed by the president later. At the annual meeting held in Nashville recently business of a routine character was transacted. The entertainment features consisted of a luncheon at the Tulane Hotel, a fish fry at Hyde's Ferry and a theater party. The meeting was presided over by former President W. H. Grewar, of Nashville. The committee on entertainment was composed of M. Gallagher, Chas. Preston, W. H. Grewar and P. J. Kane, assisted by J. B. Kean, the local president

NEW BUSINESS VENTURES.

Fall River, Mass.—The American Plumbing & Heating Co. has been incorporated with a capital of $15,000 to conduct a general plumbing business. The incorporators are: James H. Gidard, C. G. Swansea and John F. Swift, all of Fall River.

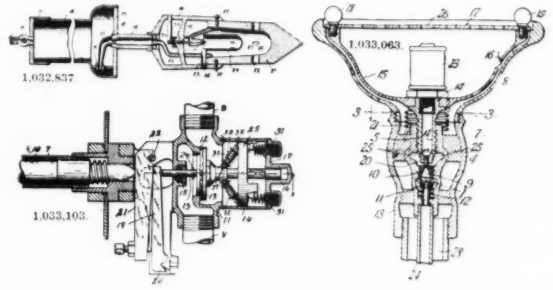
Cleveland, O.—The G. H. Arndt Co. has recently been incorporated with a capital of $10,000 to engage in a plumbing, gas and steam fitting business. The incorporators are: G. H. Arndt, Amanda Arndt, E. F. Umlaut, F. R. Arndt and A. A. Cartwright.



Plumbing Department.

1,032,837. Self-Heating Soldering-Iron. Roy Merle Jett, Greenville, Ill. A soldering iron including a combined handle and fuel reservoir, a feed pipe carried thereby, a yoke carried by said feed pipe, a hollow soldering point secured to the yoke branches, a bracket bridging said branches, a burner nozzle disposed in said soldering point, a jet nozzle carried by said bracket and confronting the open end of said burner nozzle, a fuel supply pipe connected to said feed pipe and carried forwardly into said soldering point, being then directed about the burner nozzle in a half convolution, and then carried rearwardly and connected to said jet nozzle, and a needle valve carried by said bracket for regulating the discharge of fuel from said jet nozzle.

1,033,063. Sanitary Drinking-Fountain. Leslie A. Cooper, Springfield, Mass. A valve body having a bowl portion at the top, the body having a threaded axial bore and one or more other passages through it, a valve seat in the bore below the threaded portion, a valve in the bore movable to engage the seat by upward movement, a hollow threaded operating member turning in the thread-

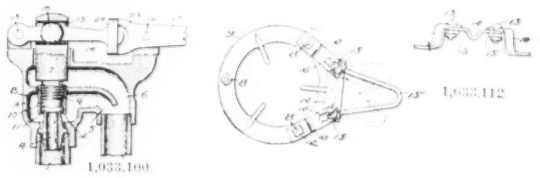


ed bore to engage and unseat the valve when advanced, a bubble member on the operating member in the bowl, the operating member having arms projecting upwardly adjacent the bowl, and a perforated plate supported on the arms below the top of the bowl and above the bubble member.

1,033,103. Water-Heater. Herbert S. Humphrey, Kalamazoo, Mich. The combination of a valve casing provided with a valve seat and a reciprocating member cylinder alined therewith; a valve stem; a valve slidably mounted on said stem, said stem being provided with stops for limiting the movement of the valve and stem relative to each other, the valve when closed being out of engagement with both stops to permit a limited movement of the valve stem without unseating the valve; an annular reciprocating member arranged in said cylinder; levers pivotally mounted on the head of the cylinder, said valve stem being slotted to receive the inner ends of the levers; links connecting the outer ends of the levers to said reciprocating member; return springs connected to the head of said cylinder and to said reciprocating member; spring supports pivotally connected to said reciprocating member and to said valve, said supports being formed of telescoping sections; and coiled springs arranged on said supports, the support sections being provided with rests for the spring whereby when the plane of the pivots connecting said supports to said reciprocating member moves past the plane of the pivots connecting said supports to said valve, the said springs act on the valve to open and close the same.

1,033,100. Ball-Cock for Flush-Tanks. William A. Henn, Evansville, Ind. The combination with a ball cock and a pivoted lever operatively connected thereto, of a pivoted float lever, and a connection between the free ends of the ball cock lever and float lever, consisting of a vertically disposed flattened rounded end on the ball cock lever and a vertically arranged elongated stirrup rigidly connected to the float lever and loosely receiving said rounded end.

1,033,112. Soldering-Iron Holder. Joseph L. Mayhew, Oak Bluffs, Mass. As an article of manufacture a soldering-iron holder for attachment to gasolene furnaces, comprising two angular, iron brackets to adjustably engage rim of the furnace, a connecting strip or crotch section, adjustably connected with said brackets, and an arm loop, adjustably connected with said brackets and with said connecting strip or crotch section, said arm loop

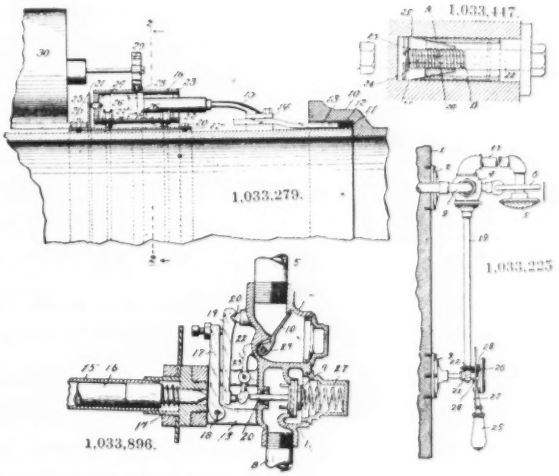


forming an outward holder or support for the shank of a soldering-iron.

1,033,279. Machine for Calking Pipe-Joints. Colin C. Simpson, jr., Flushing, N. Y. A device of the class described comprising in combination a foundation band, means for securing the same upon a pipe, a traveling receiver adapted to move over said band and a power hammer on said receiver, substantially as described.

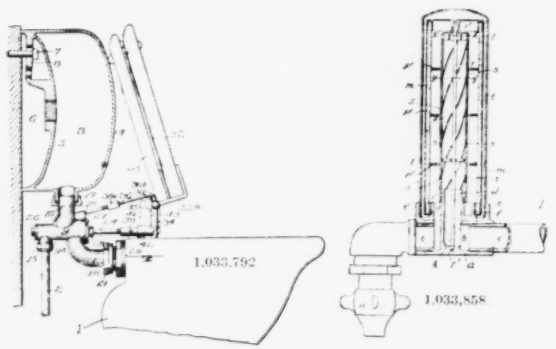
1,033,447. Expansion-Bolt. Herbert W. Mower, Newark, N. J. A shield member for expansion bolts comprising a pair of sections having an integral connecting strip extending from each section at a place intermediate of the longitudinal edges of each section and free from the longitudinal edges whereby both co-operating edges are free to separate upon expansion of the shield.

1,033,225. Shower-Bath Attachment. Bernard Badanes, New York, N. Y. In a shower bath, an overhead mixing valve, an overhead shower head connected thereto, a wall bracket supporting the mixing valve and shower head, hot and cold water supply pipes leading direct to the mixing valve and extending thereto in substantially the same horizontal plane with the mixing valve, a movable valve element to the mixing valve, and a rotatable operating rod extending from the overhead mixing valve down to a point within easy reach of the bather.



1,033,896. Water-Heater. Herbert S. Humphrey, Kalamazoo, Mich. The combination of a water heater; a reservoir having a circulating connection with said heater; a hinged circulation valve; a thermostat arranged in said reservoir; a fuel valve for said heater; a return spring for said fuel valve; circulation and fuel valve casings formed integrally and having an integrally formed supporting bracket to which said thermostat is secured,

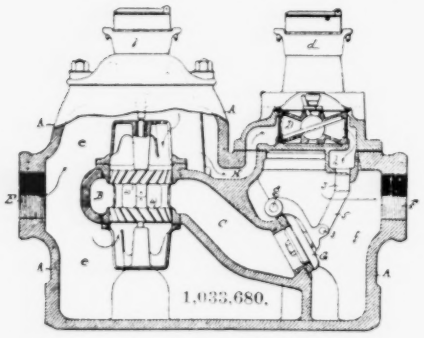
mounted on said tank; a thermostat lever pivoted on said bracket; a second thermostat lever pivoted on the circulation valve casing, the first lever being arranged to act on the second; a circulation valve actuating lever pivoted on said bracket and interposed between said second thermostat lever and the stem of the fuel valve; an arm on the stem of the said circulation valve; and a link connecting said arm to said circulation valve actuating lever.



1,033,792. Water-Closet. Edwin P. Gaylord, Rochester, N. Y. The combination with a bowl, of pivots supported from the bowl above the upper surface of the latter, a seat turning on the pivots, a flushing tank, a water supply, a valve casing connecting the water supply with the flushing tank and the latter with the bowl, an operating member controlling the flow through the casing and engaging the seat below the pivots, and a brace having a sleeve surrounding the proximate ends of the pivot and an end connected to the valve casing.

1,033,858. Self-Cleaning Filter for Domestic Water-Supply. Robert Adams, London, England. A filter comprising a casing, an inlet and an outlet for unfiltered main water, an outlet for filtered water, a filtering medium, and a water distributer rotatably disposed within the filtering medium.

1,033,680. Water-Meter. Henry I. Dilts, Elmhurst, N. Y., assignor to Neptune Meter Co., Long Island City, N. Y., a corporation of New Jersey. The combination of a relatively high duty meter, a relatively low duty meter, and a common conduit having branches in which the two meters are respectively located, the inflow and outflow being common to both, with a pivoted valve controlling the flow through the high duty meter, and a plug valve

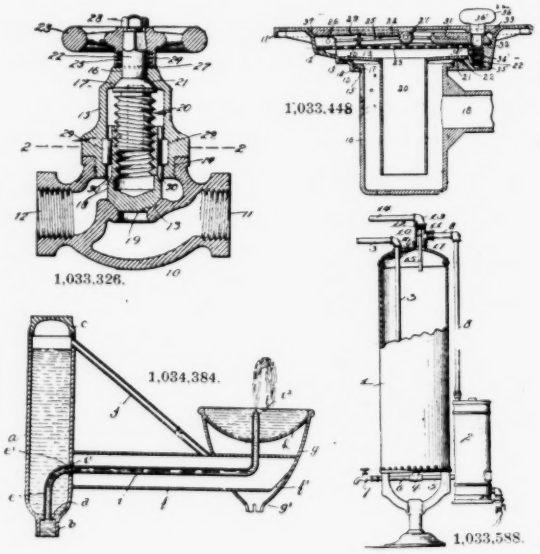


controlling the flow through the other meter and having its stem pivoted to the back of the first mentioned valve, as and for the purpose described.

1,033,326. Valve. Alphons Kremer, Gulfport, Miss. In combination with a valve body having a valve seat, a hollow cap having at its upper portion a seat and provided at its upper end with a flat surface, a stem journaled in the cap and having an annular rib adapted to fit against said seat in the cap, a wheel fixed to the upper end of the stem and having at its hub a tubular sleeve, an annular plate interposed between the lower end of the tubular sleeve and the flat top of the cap, a coiled spring housed within the sleeve and exerting pressure against the wheel to hold said annular rib in engagement with the seat of the cap, a screw plug depending from the stem, and a valve slidably mounted in the cap and restrained against rotation and engaged by said screw plug.

1,033,448. Cesspool. Philip Mueller, Decatur, Ill., assignor to H. Mueller Manufacturing Co., Decatur, Ill., a corporation of Illinois. In combination with a floor flange, a cover for the same, a connecting element hinged at one end to the underside of the cover and at its opposite end to the flange, a locking lever hinged to the underside and at the central portion of the cover and resting at its free end upon one side of the flange, and a clamping member carried upon said locking lever adjacent to its free end and engaging the flange whereby said locking lever is drawn down into the plane of the flange to bind said cover upon the same.

1,034,384. Drinking-Fountain. Dennis X. Coakley, Haverhill, Mass., assignor of one-half to Joe W. Bean, Haverhill, Mass. A drinking-fountain comprising a water pipe having an upwardly directed drinking nozzle, a water chamber connected at its lower end to said supply-pipe and having an overflow opening above the level of the end of said nozzle substantially as described.



1,033,588. Hot-Water Heater. James D. Hopkins, Clinton, Iowa. The combination of a boiler having cold water supply means associated therewith; a T secured to the top of the boiler, one arm of the T opening into the boiler; a hot water supply pipe having one end fitted in the stem in said T; an elbow fitted in the other arm of the T a stem attached at its upper end to said elbow and projecting through the T arms into the boiler and provided adjacent said end with a perforation, said stem having a diameter appreciably less than that of said arm to produce an interposed annular chamber opening at its lower end into the boiler, into which chamber the outlet end of said hot water supply pipe directly opens, said perforation communicating with said chamber to prevent trapping of air in said outlet end when the cold water supply means is shut off; and a hot water discharge pipe connected to said elbow.

Complimentary.

It was at the private theatricals, and the young man wished to compliment his hostess, saying:

"Madam, you played your part splendidly. It fits you to perfection."

"I'm afraid not. A young and pretty woman is needed for that part," said the smiling hostess.

"But, madam, you have positively proved the contrary."
—Boston Transcript.